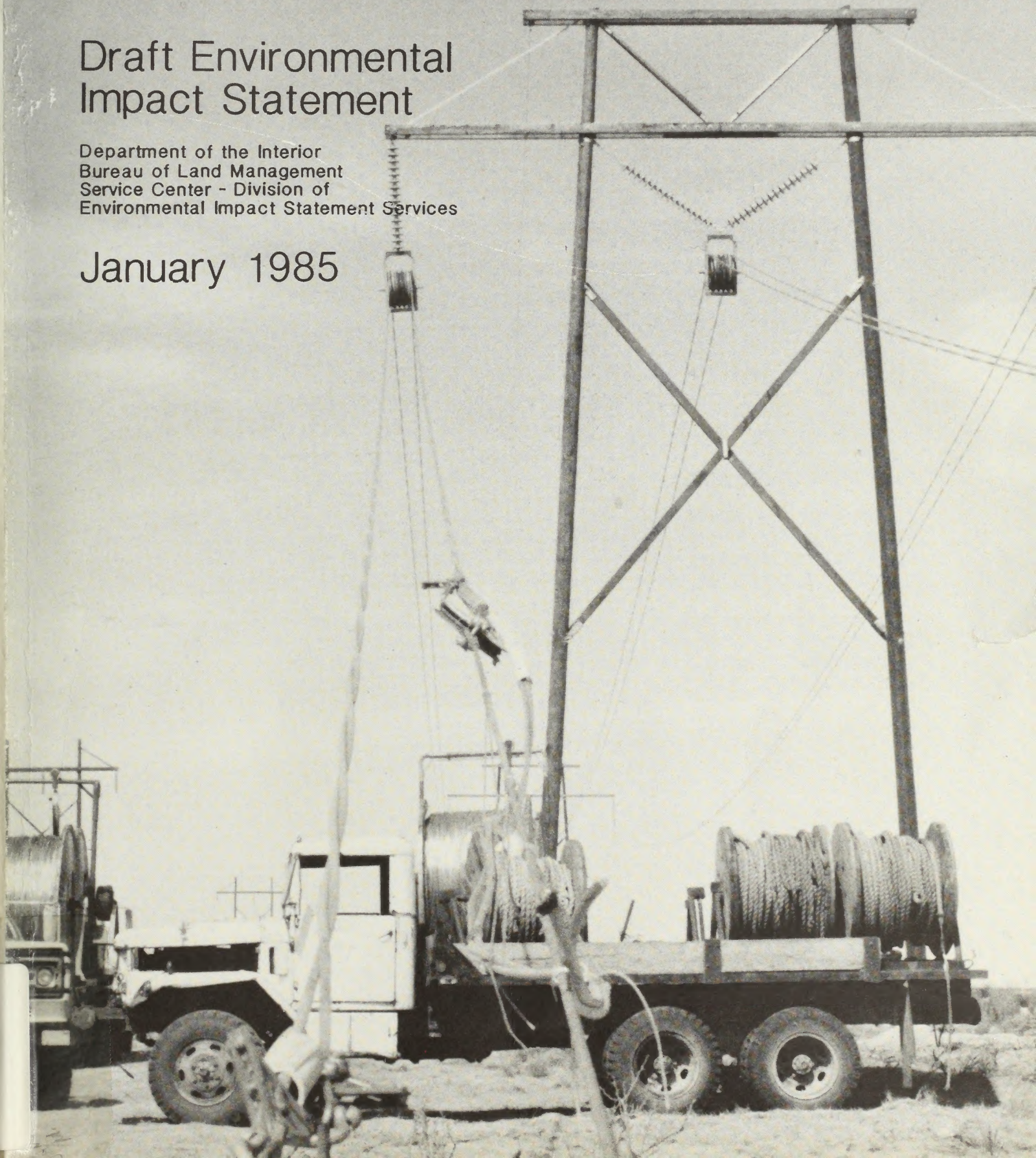
EL PASO ELECTRIC 345 KV, SPRINGERVILLE TO DEMING, TRANSMISSION LINE PROJECT

Draft Environmental Impact Statement

Department of the Interior
Bureau of Land Management
Service Center - Division of
Environmental Impact Statement Services

January 1985



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

IN REPLY
REFER TO:

Dear Reviewer:

This draft Management Framework Plan Amendment/Environmental Impact Statement (MFPA/EIS) on the proposed El Paso Electric 345 kV, Springerville to Deming, Transmission Line project is submitted for your review and comment. Please retain this draft MFPA/EIS for future reference as the final MFPA/EIS may only be an addendum.

The purpose of this public review is to improve the impact analyses presented in the draft MFPA/EIS. We welcome your comments on this MFPA/EIS. The final MFPA/EIS will be prepared considering comments received.

Comments on the draft MFPA/EIS may be submitted in writing or presented verbally at a public hearing. As indicated elsewhere in this MFPA/EIS, two public hearings will be held to receive oral comments. In order to be considered in the final EIS, all comments must be received by April 30, 1985.

Please make your comments as specific as possible. Comments will be more helpful if they include suggested changes, sources, or methodologies. Comments providing only opinions or preferences will not have a formal response, but will be included as part of the decisionmaking process.

A copy of the final MFPA/EIS will be sent to all persons who provide comments on the draft or to anyone requesting a copy. Please address written comments or requests for copies of the draft or final MFPA/EIS to:

Jack Edwards, Project Leader
Bureau of Land Management
Division of EIS Services
555 Zang Street, First Floor East
Denver, Colorado 80228
(303) 236-1080
FTS 776-1080

Sincerely yours,

Charles W. Luscher

Charles W. Luscher
State Director
New Mexico State Office

IN REPLY REFER TO

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
DENVER SERVICE CENTER
DIVISION OF EIS SERVICES
555 ZANG ST.
FIRST FLOOR EAST
DENVER, CO 80225

February 19, 1985

Dear Reader:

Many errors occurred during printing of the El Paso Electric 345 kV, Springerville to Deming Transmission Line project, draft Management Framework Plan Amendment/Environmental Impact Statement. To correct some of the more serious data errors, the attached errata is provided.

We apologize for any inconvenience this may have caused.

Sincerely,

Jack D. Edwards

Jack D. Edwards
Project Leader

EL PASO ELECTRIC 345 kV,
SPRINGERVILLE TO DEMING,
TRANSMISSION LINE PROJECT

ERRATA

TEXT CHANGES

Page	Column	Para	Line	IS:	SHOULD BE:
52	R	1	4-5	-total employment or per capita personal income of a county;	-population, total employment or per capita personal income of a county;
72	L	1	5	Table 2-16 The Very Array Alternative would affect...	The Very Large Array Alternative would affect...

TABLE CHANGES

Table 1 (pages 2 through 4; same as Table 4-1, pages 114 through 116)

Element	Proposed Action	Very Large Array Alternative (A)	San Agustin Alternative (B)	Gila Alternative
IS:				
Visual Resources				
VQO Partial Retention	0.0	0.0	0.0	11.5(+11.5) Miles Allowed
U.S. Highway 60 view area	2.5	2.5	27.5 (+25.5)	0 (-2.0)
Wilderness				
Wilderness Units Affected (Significance would depend on user's perspective and viewpoint)	Mesita Blanca and Eagle Peak WSAs Continental	Mesita Blanca, Eagle Peak, Horse Mountain, and Continental Divide WSAs	Mesita Blanca, Eagle Peak, Horse Mountain, and WSA Divide WSAs	Blue Range Wilderness and San Francisco
Recreation Resources				
Values Significantly Affected	Plains of San Agustin, Mesita Blanca (Red Hill cinder cone), and Eagle Peak	Plains of San Agustin, Mesita Blanca, Eagle Peak, Horse Mountain, and Continental Divide WSAs	Mesita Blanca, Eagle Peak, Horse Mountain, and Continental WSAs	Blue Range Wilderness and San Francisco WSA; San Francisco and Gila rivers
Soils and Vegetation				
Acres disturbed during Construction	609.0	645.0 (+36.0)	717.0 (+08.0)	464.0 (-145.0)
Livestock Grazing				
Grazing loss (AUMs/year, short term)	54	59 (+5)	66 (+12)	60 (+6))
Livestock Watering Facilities within 250 feet of Line	0	8 (+1)	11 (+12)	9 (0)
SHOULD BE:				
Visual Resources				
VQO Partial Retention	0.0	0.0	0.0	11.5 (+11.5)
U.S. Highway 60 view area	2.5	2.5 (0.0)	2.5 (0.0)	3.0 (+0.5)
Wilderness				
Wilderness Units Affected (Significance would depend on user's perspective and viewpoint)	Mesita Blanca and Eagle Peak WSAs	Mesita Blanca, Eagle Peak, Horse Mountain, and Continental Divide WSAs	Mesita Blanca, Eagle Peak, Horse Mountain, and Continental Divide WSAs	Blue Range Wilderness and San Francisco WSA
Recreation Resources				
Values Significantly Affected	Plains of San Agustin and Mesita Blanca (Red Hill cinder cone) and Eagle Peak WSAs	Plains of San Agustin, and Mesita Blanca, Eagle Peak, Horse Mountain, and Continental Divide WSAs	Mesita Blanca, Eagle Peak, Horse Mountain, and Continental Divide WSAs	Blue Range Wilderness and San Francisco WSA; San Francisco and Gila rivers
Soils and Vegetation				
Acres disturbed during Construction	609.0	645.0 (+36.0)	717.0 (+108.0)	464.0 (-145.0)
Livestock Grazing				
Grazing loss (AUMs/year, short term)	54	59 (+5)	66 (+12)	60 (+6)
Livestock Watering Facilities within 250 Feet of Line	9	8 (-1)	11 (+2)	9 (0)

TABLE 2-1 (page 38)

Milepost
IS:
9.5-2.0
SHOULD BE:
9.5-12.00

TABLE 2-11 (page 64)

Milepost	Number of Miles
IS:	
33.0-49.0A	15.0
SHOULD BE:	
33.0-49.0A	16.0

TABLE 2-12 (page 65)

Milepost	Primary Viewpoints and Description of Impacts
IS:	
25-31A	Viewed from State Highway 90 as fg/mg. Would add 1.0 IV elements of form and line to natural-appearing landscape.
89-84A	Viewed from State Highway 52 and community of Winston a fg/mg.
106-111A	Constrasts in form and line with near-natural landscape.
SHOULD BE:	
25-31A	Viewed from State Highway 27 as fg/mg. Would add elements of form and line to natural-appearing landscape.
82-84A	Viewed from State Highway 52 and community of Winston as fg/mg.
106-111A	Viewed from State Highway 52 and local ranches as fg/mg. Contrasts in form and line with near-natural landscape.

TABLE 2-18 (page 75)

Milepost	Class II	Class III	Class IV
IS:			
35.0-50.5B	15.5		
120.5-131.5B		11.0	
SHOULD BE:			
35.0-50.5B			15.5
120.5-131.5B			11.0

TABLE 2-19 (page 76)

Milepost	Primary Viewpoints and Description of Impacts
IS:	
0.0-26.0B	Viewed from U.S. Highway 180, State Highway 26, 21.0 III and rural residences as fg/mg.
26.0-32.0B	Viewed from State Highway 27 as fg/mg. Would add 4.5 III elements of form and line to natural-appearing landscape.
52-56B	Viewed from State Highway 90 as fg/mg. Would add 1.0 IV elements of form and line to natural-appearing landscape.
89-97B	Viewed from State Highways 52 and 59 as fg/mg.1.5 IV Contrasts in elements of form and line in a natural-appearing landscape.
SHOULD BE:	
0.0-26.0B	Viewed from U.S. Highway 180, State Highway 26, and rural residences as fg/mg.
26.0-32.0B	Viewed from State Highway 27 as fg/mg. Would add elements of form and line to natural-appearing landscape.
52-56B	Viewed from State Highway 90 as fg/mg. Would add elements of form and line to natural-appearing landscape.
89-97B	Viewed from State Highways 52 and 59 as fg/mg. Contrasts in elements of form and line in a natural-appearing landscape.

TABLE 2-26 (pages 86-87)

Wildlife Species	Miles of Occupied Habitat	Crucial Habitats	Habitat Trends[1]	Population Estimate	Population Trend	Acres of Temporarily Removed[2]
IS:						
Elk						
MP 99B-109B	10		stable(3)	125	stable	40
MP 111B-121B	10	stable(7)	150	stable	40	
MP 135B-155B	20	decreasing(6)	100	stable	77	
TOTAL:	40					157
SHOULD BE:						
Elk						
MP 99B-109B	10	None	stable(3)	125	stable	40
MP 111B-121B	10	None	stable(7)	150	stable	40
MP 135B-155B	20	None	decreasing(6)	100	stable	77
TOTAL:	40					157

TABLE 2-28 (pages 90 and 91)

Milepost	Existing VRM Class	Primary Viewpoints Description of Impacts
IS:		
59-77C	III IV	Viewed from U.S. Highway 180, communities of mangus Springs and Riverside, ranch and other rural residences, and potential candidate river for designation as wild and scenic River (Gila River) as fg/mg. Scale of towers and conductors would dominate landscape. Portions skylighted.
84-87C	III	Viewed from U.S. Highway 180 and State Highway 78 as fg/mg.
119-120C	PR	Viewed from U.S. Highway 180 as fg/mg. Facility elements, would add to cumulative scale...
128-129C	PR	Viewed from State Highway 12 as mg and Bg.
SHOULD BE:		
59-77C	II IV	Viewed as fg/mg from U.S. Highway 180, communities of Mangus Springs and Riverside, ranches, other rural residences, and Gila River (potential candidate for designation as wild and scenic river). Scale of towers and conductors would dominate landscape. Portions skylighted.
84-87C	II	Viewed from U.S. Highway 180 and State Highway 78 as fg/mg.
119-120C	PR	Viewed from U.S. Highway 180 as fg/mg. Facility elements would add to cumulative scale...
128-129C	PR	Viewed from State Highway 12 as mg and bg.

Department of the Interior

Draft
Environmental Impact Statement

on the

EL PASO ELECTRIC 345 KV SPRINGERVILLE TO DEMING TRANSMISSION LINE

Prepared by

BUREAU of LAND MANAGEMENT

JANUARY 1985

Charles W. Luscher

Director, New Mexico State Office

COVER SHEET

El Paso Electric 345 kV, Springerville to Deming, Transmission Line Project, Management Framework Plan Amendment/Environmental Impact Statement

(X) Draft ( ) Final

Lead Agency

U.S. Department of the Interior
Bureau of Land Management

Cooperating Agencies

U.S. Department of Agriculture
Forest Service

U.S. Department of Energy
Bonneville Power Administration

Counties that could be Directly Affected

Luna, Sierra, Socorro, Catron, and Grant Counties, New Mexico

Abstract

This Management Framework Plan Amendment/ Environmental Impact Statement (MFPA/EIS) assesses the environmental consequences of the federal approval of the El Paso Electric Company (El Paso) 345 kV, Springerville to Deming, Transmission Line project.

El Paso proposes to build and operate a 203-mile-long, single circuit, 345 kV transmission line from a point on the Tucson Electric Power Company's existing 345 kV transmission line near Red Hill, New Mexico to El Paso's Luna substation, 1.5 miles north of Deming, New Mexico. Major components of the project would include the transmission line and the installation of more substation equipment at the existing Luna substation.

The draft MFPA/EIS analyzes the effects of building, operating, maintaining, and abandoning the Proposed Action and alternative transmission lines. Three alternatives are assessed in detail: the Very Large Array Alternative (A), the San Agustin Alternative (B), and the Gila Alternative (C). This MFPA/EIS also addresses a No-Action Alternative, which analyzes the effects of denying the requested rights-of-way for the transmission line.

Based on the issue of whether to develop a new right-of-way corridor and the concerns identified during the scoping process, the MFPA/EIS focuses on potential impacts to the Very Large Array from electromagnetic interference, and to visual resources, wilderness, soils and vegetation, and livestock grazing.

MFPA/EIS Contact

Comments on this MFPA/EIS should be directed to:

Jack D. Edwards, Project Leader
Bureau of Land Management
Division of EIS Services
555 Zang Street, First Floor East
Denver, Colorado 80228

(303) 236–1080 FTS 776–1080

Date MFPA/EIS Made Available to EPA and the Public

January 30, 1985

Date by Which Comments Must Be Received

April 30, 1985

PREFACE

The purpose of this management framework plan amendment/environmental impact statement (MFPA/EIS) is to analyze the potential environmental consequences resulting from construction, operation, maintenance, and abandonment of the proposed El Paso Electric 345 kV, Springerville to Deming, Transmission Line project and alternatives to this proposal. This MFPA/EIS is intended to provide enough details to enable the public to understand the project and the decisionmakers to make a knowledgeable decision.

The MFPA/EIS contains four chapters and eight appendices. Chapter 1 of this MFPA/EIS contains a description of the Proposed Action, Very Large Array Alternative (A), San Agustin Alternative (B), Gila Alternative (C), and No-Action Alternative. Chapter 2 describes the affected environment and analyzes potential impacts from the project to a variety of resource categories. Chapter 3 identifies benefits, trade-offs, and long-term commitments of resources. Chapter 4 contains the comparative analysis. The appendices provide additional resource material that supplement the information contained in this MFPA/EIS.

The following federal action requests initiated the preparation of this EIS: applications for right-of-way grants across public land for a transmission line and for expansion of the Luna substation. The results of this analysis, as documented in this MFPA/EIS, will be used in making decisions on whether to approve, modify, or disapprove the above-requested actions and whether to modify the MFP to include a new corridor.

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LIST OF PREPARERS

Name	Education	EIS Responsibility
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Janis L. VanWyhe Assistant Project Leader	BA, Environmental Studies	EIS Coordination Chapter 1, Preparation Plan
Marvin James Chief, Environmental and Planning Staff BLM, New Mexico State Office	BS, Animal Husbandry	Consultation and Coordination
Richard E. Traylor Environmental Coordinator	BS, Forestry MS, Forestry Management	Environmental Coordination, Quality Control
Janet J. Poorman Technical Editor	College Credit Earned: 4 yrs. English, Chemistry; 1 yr. Law	Project Editor; Coordination, Review, and Editing; Document Assembly; Appendix 1
Betty K. Wilson Project Secretary		Project Secretary; List of Preparers; References Cited; Word Processing and Copy Editing
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Brenda Cazier Editorial Assistant	AA, Nursing	Word Processing and Copy Editing
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Herbert K. McGinty Editor	MA, Geography BA, History	Editing; Summary
Elwyn (Bud) Rolofson Meteorologist	BS, Meteorology	Air Resources
Byron L. Shark Engineer	BS, Engineering	Project Description, Data Fact Sheets; Authorizing Actions, Federal General Measures, Appendix 2
Stanley V. Specht Landscape Architect	MLA, Landscape Architecture MUP, Urban Planning BS, Landscape Architecture	Visual Resources, Wilderness, Recreation Resources, Appendix 5
David Willard Economist	MA, Economics BA, Economics	Socioeconomics, Appendix 8
Vern Chartier Chief High Voltage Phenomena Engineer; Department of Energy, Bonneville Power Administration	BS, Electrical Engineering BS, Business	Electromagnetic Interference and Effects; Appendix 4
Ronald Henderson Recreation and Lands Staff, Gila National Forest	BS, Forest Management	Forest Management

A special acknowledgement and thank you to the El Paso Electric Company for providing photographs for the cover and Chapter 1.

PUBLIC HEARINGS INFORMATION

Public Hearings on the El Paso Electric 345 kV, Springerville to Deming, Transmission Line project will be held at the following locations:

Public Hearing Location	Date
Deming City Council Chamber 309 South Gold Avenue Deming, New Mexico 88030	April 2, 1985 1:30 p.m.
Catron County Court House Reserve, New Mexico 87830	April 3, 1985 1:30 p.m.

The hearings will be held pursuant to the objectives of the National Environmental Policy Act (Public Law 91-190; 83 Stat. 852) to receive comments (testimony) on the scope of the draft MFPA/EIS and the adequacy of the impact analysis. Testimony presented at these hearings will be considered in the preparation of the final MFPA/EIS.

The public hearings will be conducted by a Bureau of Land Management (BLM) official who will be accompanied by other BLM and Forest Service personnel involved in preparing this draft. The panel members may ask questions of the witness to clarify points in the testimony. All hearing proceedings will be recorded.

Before giving testimony at the public hearing, participants are requested to complete a hearing registration form. A REGISTRATION FORM IS INCORPORATED AS THE LAST PAGE OF THIS VOLUME. Additional forms may be obtained from the address shown on the registration form. Registration forms must be returned to that address no later than February 27, 1985. Participants may also register at the registration desk at each hearing.

After the last witness has been heard, the hearings administrator will consider the requests of other persons present who wish to testify. Only one witness will be allowed to present the viewpoint of a single organization at any one hearing. However, any witness will be permitted to give relevant testimony if it is offered as the opinion of a private citizen.

Persons wishing to give oral testimony will be limited to 10 minutes. Written submissions may also be presented at the hearing.

SUMMARY

SUMMARY

The El Paso Electric Company (El Paso) has applied to the Bureau of Land Management (BLM), Las Cruces District Office, for a right-of-way permit to build and operate a 203-mile-long, 345 kilovolt (kV) transmission line from its Luna substation, 1.5 miles north of Deming, New Mexico, to a point on the existing Tucson Electric Power Company (TEPC) transmission line near Red Hill, New Mexico. About 68.5 miles of the proposed line would cross public land. The right-of-way would be 100 feet wide.

The Proposed Action transmission line would use wood towers, 51 to 55 feet high, placed at an average interval of 800 feet. The transmission line would need about 1,340 towers or an average of 6.6 structures per mile.

El Paso also proposed to install more substation equipment at the existing Luna substation. The additions would consist of a 345 kV circuit breaker, two switches, a dead-end tower, and relay equipment. No more land would be needed for this equipment.

Communication and control would be provided through a microwave radio system. The existing complex already has the needed control house, which would contain the electronic equipment and protective relay systems.

The transmission line would be built in two spreads, each consisting of equipment and crews (30 to 65 workers), handling the construction phases of a given segment. Construction would begin at the middle of the line and work toward either end to allow earlier completion of most construction in the higher elevations. Construction would begin in 1986 and continue for 12 months.

Construction would require a 70-foot by 100-foot area at each tower site for placing equipment and tower assembly, and spur roads would be needed for access from existing roads to some tower sites. After construction is completed, the transmission line would be paralleled by a two-track road used only once every 6 weeks for routine patrol by four-wheel drive vehicle.

In addition to the Proposed Action, four alternatives are considered in this analysis: the Very Large Array (A), San Agustin (B), Gila (C), and No-Action. The construction techniques and types of transmission line towers needed for the Very Large Array, San Agustin, and Gila alternatives are discussed in Chapter 1.

MAJOR ISSUES

During the scoping process, several general concerns were raised relating to electromagnetic interference and effects, wilderness values, visual resources, soils and vegetation, and livestock grazing. Appendix 1, Consultation and Coordination, lists the resource concerns and details the scoping process.

MAJOR IMPACT CONCLUSIONS

The analysis of the El Paso Electric 345 kV, Springerville to Deming transmission line project focuses on impacts caused by:

- displacing resources (such as cultural resources);
- using resources or creating other changed conditions (such as vegetation removal during construction);
- or creating changed conditions on the human and natural environment of the area (such as visual disturbances).

This project would cause some short-term and long-term impacts, which are assessed in this Management Framework Plan Amendment/Environmental Impact Statement (MFPA/EIS). The significance of potential impacts to the various resources from project construction and operation are based on the significance criteria identified by resource in Chapter 2. Impacts judged to be significant are compared by alternative in Table 1.

This MFPA/EIS does not discuss water resources, geological and fossil resources, cropland, or aquatic wildlife because these resources or conditions would not be significantly affected by the Proposed Action or alternatives. Conflicts with state, county, or local land use plans or policies are addressed in Chapter 1, Consistency With Other Plans; conflicts with Bureau of Land Management land use plans are addressed in Chapter 1, Conformance; and Conflicts with Forest Service land management plans are addressed in Chapter 2, Forest Management.

No federally listed or proposed threatened or endangered plant or animal species are known to occur along any of the proposed routes, but three candidate

SUMMARY

TABLE 1
COMPARATIVE ANALYSIS

Element	Proposed Action	Very Large Array Alternative (A)	San Agustin Alternative (B)	Gila Alternative (C)
Total Length of Transmission Line				
Miles	203	215 (+12)	228 (+25)	173 (−30)
Estimated Cost of Transmission Line	$32,884,000	$34,357,000 (+$1,473,000)	$42,854,000 (+$9,970,000)	$40,068,000 (+$7,184,000)
Electromagnetic Interference				
Existing VLA	No Interference	No Interference	No Interference	No Interference
Future VLA Expansion	Interference	No Interference	No Interference	No Interference
Visual Resources				
Miles Significantly Affected				
VRM Class II	28.5	23.0 (−5.5)	10.5 (−18.0)	32.5 (+4.0)
VRM Class III	29.5	28.0 (−1.5)	41.0 (+11.5)	6.0 (−23.5)
VRM Class IV	5.0	3.0 (−2.0)	2.5 (−2.5)	0.0 (−5.0)
VQO Partial Retention	0.0	0.0	0.0	11.5 (+11.5) Miles Allowed
Miles of Public Areas of Concern Crossed				
Plains of San Agustin	26.5	16.0 (−10.5)	1.0 (−25.5)	0 (−26.5)
U.S. Highway 180 view area	2.0	2.0 (0.0)	2.0 (0.0)	46.0 (+44.0)
U.S. Highway 60 view area	2.5	2.5 (0.0)	27.5 (+25.5)	0 (−2.0)
State Highway 26 view area	2.0	2.0 (0.0)	27.5 (+25.5)	0 (−2.0)
Cultural Resources				
Number of Known Cultural Sites within 1-Mile-Wide Corridor	39	40 (+1)	36 (−3)	124 (+85)
Acres of High Site Probability	180	180 (0)	189 (+9)	170 (−10)

TABLE 1 (Continued)
COMPARATIVE ANALYSIS

Element	Proposed Action	Very Large Array Alternative (A)	San Agustin Alternative (B)	Gila Alternative (C)
Recreation Resources				
Values Significantly Affected	Plains of San Agustin, Mesita Blanca (Red Hill cinder cone), and Eagle Peak	Plains of San Agustin, Mesita Blanca, Eagle Peak, Horse Mountain, and Continental Divide WSAs	Mesita Blanca, Eagle Peak, Horse Mountain, and Continental WSAs	Blue Range Wilderness and San Francisco WSA; San Francisco and Gila rivers
Soils and Vegetation				
Acres Disturbed during Construction	609.0	645.0 (+36.0)	717.0 (+08.0)	464.0 (−145.0)
Miles of Sensitive Soils and Terrain Crossed	29.1	36.8 (+7.7)	41.4 (+12.3)	29.3 (+0.2)
Livestock Grazing				
Grazing Loss (AUMs/year, short term)	54	59 (+5)	66 (+12)	60 (+6))
Number of Ranch Headquarters and Dwellings within 250 Feet of Line	4	1 (−3)	2 (−2)	5 (+1)
Livestock Watering Facilities within 250 Feet of Line	0	8 (+1)	11 (+2)	9 (0)
Transportation Networks (Short-term increases)				
Accidents	12.4	12.4 (0)	13.2 (+0.8)	7.2 (−5.2)
Congestion	Yes	Yes	Yes	Yes
Maintenance	Yes	Yes	Yes	Yes
Socioeconomics				
Population Increase (short term)	250	250 (0)	280 (+30)	320 (+70)
Total Construction Employment	250	250 (0)	350 (+100)	440 (+190)

TABLE 1 (Concluded)
COMPARATIVE ANALYSIS

Element	Proposed Action	Very Large Array Alternative (A)	San Agustin Alternative (B)	Gila Alternative (C)
Increase in Annual Local Government Revenue during Operation ($000)	77	79 (+2)	95 (+18)	99 (+22)
Wilderness				
Wilderness Units Affected (Significance would depend on user's perspective and viewpoint.)	Mesita Blanca and Eagle Peak WSAs Continental	Mesita Blanca, Eagle Peak, Horse Mountain, and Continental Divide WSAs	Mesita Blanca, Eagle Peak, Horse Mountain, and WSA Divide WSAs	Blue Range Wilderness and San Francisco
Terrestrial Wildlife (Acres temporarily disturbed)				
Mule Deer Habitat (Acres)				
All Habitat	372	417 (+45)	266 (−106)	343 (−29)
Crucial Habitats	19	30	19	41
Coues Whitetail Deer Habitat	None	None	None	168 (+168)
Elk Habitat	None	None	157 (+157)	64 (+64)
Pronghorn Habitat	147	177 (+30)	263 (+116)	123 (−24)
Bighorn Sheep Habitat	None	None	None	16 (+16)
Black Bear Habitat	177	207 (+30)	307 (+130)	343 (+166)
Javelina Habitat	279	297 (+18)	285 (+6)	394 (+115)
Turkey Habitat	111	110 (−1)	198 (+87)	125 (+14)
Quail Habitat	240	240 (0)	221 (−19)	358 (+118)
Forest Management				
Conflicts with Goals of Draft Management Plan	None	None	Fire Management, Utility Corridor	Utility Corridor, Allowable Saw Timber Harvest, Visual Management, Forage and Wildlife Habitat

NOTE: Numbers in parentheses represent differences between the Alternative and the Proposed Action

WSAs = Wilderness Study Areas; VLA = Very Large Array; $000 = thousands of dollars; AUMs = animal unit months

species could be affected by the El Paso project—loach minnow, spikedace, and Mimbres figwort. In addition, no state listed or proposed threatened or endangered animal species would be affected by any of the routes. Six plant species are listed by the State of New Mexico as taxa of concern that could occur on or along some or all of the routes. Once a route has been chosen and a staked line established, surveys should be carried out for state-listed threatened and endangered species. This survey should be coordinated with the Natural Resources Department, Resources Management and Development Division. (See letters from Fish and Wildlife Service and the State of New Mexico, Appendix 3.)

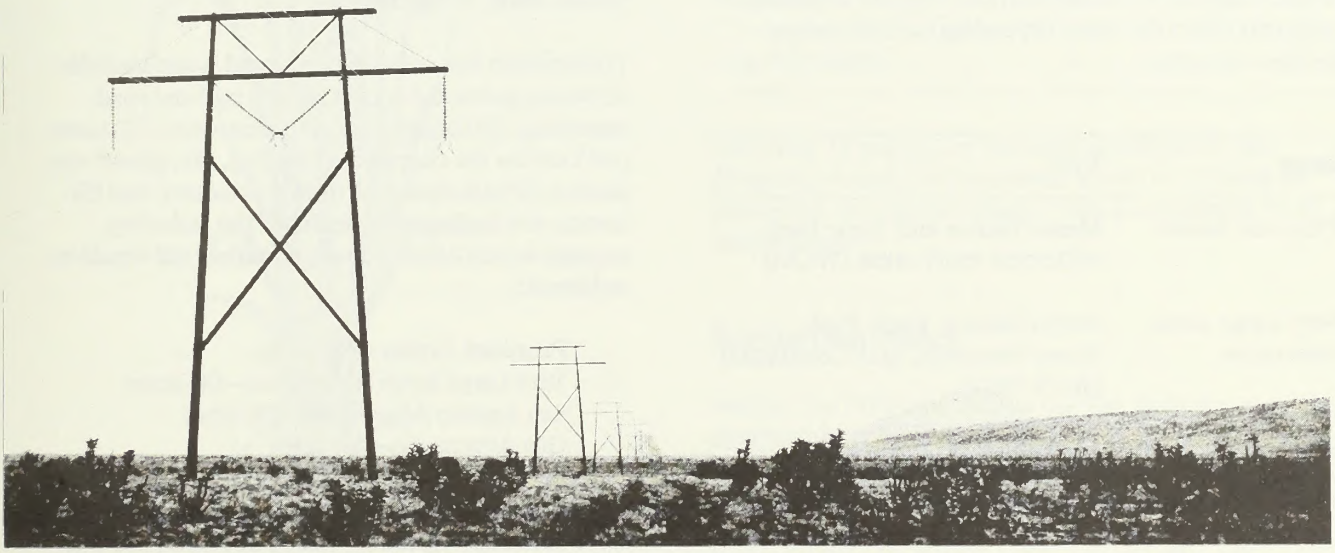
Since no federally listed or proposed species occur along any of the proposed routes, formal Section 7 consultation with the Fish and Wildlife Service is not required. The candidate species listed in Appendix 3 should be considered in future planning, however.

The impact analysis assumes that certain types of mitigation would be implemented to ease or reduce adverse impacts, including measures incorporated into the applicant's proposed plan of operations. These measures are committed to by the applicant and described in Appendix 2.

Electromagnetic Interference and Effects

Neither the Proposed Action nor the alternatives would cause electromagnetic interference with either the existing Very Large Array (VLA) or the proposed Very Long Baseline Array. Construction of The Proposed Action route would preclude the proposed 13-mile extension of the southwest arm of the VLA.

The results of scientific studies of electric or magnetic fields have not shown that transmission lines noticeably affect the health or behavior of humans, livestock, or wildlife.



Visual Resources

The main significant adverse visual resource impacts of the Proposed Action or alternatives would result from placing a transmission line on a natural-appearing landscape. The resulting changes would generally not meet the standards of the Visual Resource Management (VRM) class or Visual Quality Objective for the areas where the project would be located.

The Proposed Action would significantly affect 28.5 miles of VRM Class II areas, 29.5 miles of Class III areas, and 5 miles of Class IV areas. The Very Large Array Alternative would significantly affect 23 miles of VRM Class II areas, 28 miles of Class III areas, and 3 miles of Class IV areas. The San Agustin Alternative would significantly affect 10.5 miles of VRM Class II areas, 41 miles of Class III areas, and 2.5 miles of Class IV areas. The Gila Alternative would significantly affect 43.5 miles of VRM Class II areas, 34.5 miles of Class III areas, and 7.5 miles in a Forest Service, Visual Quality Objective, Partial Retention area. The addition

of a third transmission line along the two existing TEPC lines would create a cumulative impact on the visual resource that would not be an acceptable change.

Cultural Resources

Because the exact locations of transmission line facilities are unknown for the Proposed Action or alternative routes, specific cultural resource impacts cannot be predicted. Effective use of the cultural survey and compliance procedures described in Appendix 2 would prevent significant, adverse cultural resource impacts.

Wilderness

No significant, direct impacts to the wilderness resource are anticipated as a result of the Proposed Action or alternative routes crossing the boundary of any unit, since no crossings are planned. Noise and dust from construction of any of the transmission lines would be temporary and insignificant.

Outside sights of a transmission line from the following units may affect the users, depending on their perspective and viewpoint.

Route	Unit
Proposed Action	Mesita Blanca and Eagle Peak wilderness study areas (WSAs)
Very Large Array Alternative	Mesita Blanca, Eagle Peak, Horse Mountain, and Continental Divide WSAs
San Agustin Alternative	Mesita Blanca, Eagle Peak, Horse Mountain, and Continental Divide WSAs
Gila Alternative	Blue Range Wilderness and San Francisco WSA

Recreation Resources

Most of the significant impacts to recreation resources from the Proposed Action or alternatives would involve degradation of scenic areas and views. The Proposed Action and San Agustin Alternative would significantly degrade the scenic values of the Plains of San Agustin, and the Very Large Array and San Agustin alternatives would significantly degrade the scenic, semi-primitive values in the Horse Mountain and Continental Divide WSAs. The Proposed Action and the San Agustin and Very Large Array alternatives would significantly affect the scenic qualities of the Red Hill cinder cone area of the Mesita Blanca WSA as well as the natural and primitive nature of the Eagle Peak and Mesita Blanca WSAs.

The Gila Alternative would significantly affect recreation opportunities and users of the Gila and San Francisco rivers. Similarly, sightseers along U.S. Highway 180, including the Aldo Leopold Vista, and visitors to the Blue Range Wilderness would be distracted from the scenic quality of the areas because of the cumulative, long-term impacts of an additional transmission line near two existing TEPC transmission lines.

The Proposed Action and alternatives would not sigificantly impair the scenery enjoyed by hikers on the Continental Divide National Scenic Trail.

Soils and Vegetation

Transmission line construction would create land disturbances associated with (1) access trail and road upgrading, (2) temporary road construction, (3) tower pad location site clearing and grading, (4) right-of-way clearing for safe clearance from conductors, and (5) storage and staging area clearings. The following acreages would be temporarily disturbed (all would be reclaimed):

Proposed Action—609 acres
Very Large Array Alternative—645 acres
San Agustin Alternative—739 acres
Gila Alternative—464 acres

The Proposed Action and alternatives would similarly affect soils and vegetation. Along all routes, impacts to soil would not be significant because soil loss and loss of soil productivity and stability would be reduced with the use of effective erosion control and reclamation measures. Disturbed land would return to near-preconstruction conditions. Some unquantifiable amount of soil would be lost from accelerated wind and water erosion until erosion control measures are implemented.

Impacts to vegetation would also generally be insignificant. Understory vegetation is expected to return to near-preconstruction conditions within 5 years after construction with the effective use of erosion control,

reclamation, and revegetation measures. Overstory vegetation (trees and shrubs) would take longer to become established to near preconstruction conditions but would be growth-controlled or permanently removed and replaced with understory vegetation to allow access and provide safe transmission line operation. Generally, only small areas (at tower sites and beneath the lines) of overstory would be disturbed. Larger areas of disturbance may be required in steeper terrain.

Timothy

Livestock Grazing

Transmission line construction would cause a 1- to 5-year insignificant loss of the following amounts of forage:

Proposed Action—54 animal unit months (AUMs)
Very Large Array Alternative—59 AUMs
San Agustin Alternative—66 AUMs
Gila Alternative—60 AUMs

A transmission line operating directly over or within 250 feet of ranch facilities could pose potential hazards to the maintenance of wells and windwills; storage of livestock feed; and use of ranching equipment such as loaders, booms, and large trucks. These hazards could occur from contact with towers and conductors, causing injury, possible electrocution, and equipment damage.

The Proposed Action and the alternatives would pass within 250 feet of the following numbers of ranch headquarters or dwellings and livestock watering facilities.

Route	Ranch Headquarters or Dwellings	Livestock Watering Facilities
Proposed Action	4	9
Very Large Array Alternative	1	8
San Agustin Alternative	2	11
Gila Alternative	5	9

Less than 10 percent of the areas disturbed by the Proposed Action or alternatives would be invaded by poisonous and invader plants. This is considered to be insignificant.

Socioeconomics

Neither the Proposed Action nor the alternatives would significantly affect socioeconomic conditions but would cause the following insignificant impacts. (All of these would be temporary impacts resulting from construction of the transmission line except the property tax revenue increases, which would continue for the life of the transmission line.)

Between 1986 and 1987, construction of the Proposed Action or the Very Large Array or San Agustin alternatives would result in population growth ranging from 4 percent in Datil and 3 percent in Quemado-Omega to 1 percent or less in the other communities. Total employment growth would vary from 2 percent in Luna and Sierra counties to less than 1 percent in Apache County. Per capita personal income and property tax revenue would increase by less than 1 percent in all counties.

The Gila Alternative is expected to cause a population increase ranging from 4 percent in Reserve to less than 1 percent in Bayard, Central, Hurley, and Deming. Total employment growth would vary from 2 percent in Catron and Grant counties to less than 1 percent in Apache County. The per capita personal income increase would vary from 3 percent in Catron County to 1 percent in Apache and Luna counties. Local government revenue would rise less than 1 percent in all jurisdictions.

Transportation Networks

Construction of the Proposed Action or the Very Large Array Alternative would significantly affect transportation by increasing traffic volume on New Mexico State Highways 52, 78, and 12. Traffic along these roadway segments could fall below a safe operating level during this time. In addition, increased project-related traffic on these highways would temporarily increase accidents by 12.4 per year; 3.9 of these accidents could occur at intersections and junctions.

Increased heavy truck and traffic volume on secondary gravel and primitive roads (trails) could accelerate road deterioration and could significantly increase road maintenance costs.

Transportation impacts from construction of the San Agustin Alternative would be similar to those of the Proposed Action. Construction of this alternative would temporarily increase traffic volume on roadway segments of U.S. Highway 60 and State Highways 78, 12, 52, 90, 27, and 26. Project-related traffic could add as many as 117 vehicle trips per day to the roadway segments. U.S. Highway 60 and State Highways 26 and 90 could sustain the increased auto and truck traffic without lowering the level-of-service; the other highway segments could not. Increased project-related traffic on roadway segments would temporarily increase accidents by 13.2 per year; 4.1 of these accidents would occur at intersections and junctions.

Construction of the Gila Alternative would significantly affect transportation by increasing traffic volume on U.S. Highway 180 from south of Gila National Forest to Alpine, Arizona, and on Bill Knight Gap Road to U.S. Highway 60. These increases in traffic could lower the level-of-service. Increased project-related traffic on U.S. Highway 180 between Cliff and the Arizona State line would temporarily increase accidents by 7.2 per year; 4.4 of these accidents could occur at intersections and junctions. The level-of-service would not be lowered by project-related traffic increases on U.S. Highway 180 between the southern boundary of the Gila National Forest and Deming, nor on U.S. 60 between Springerville, Arizona and the junction of Bill Knight Gap Road.

Air Quality

The Proposed Action and alternatives would have similar insignificant impacts on air quality. Transmission line construction could stir up particulate matter and emit gaseous hydrocarbons and oxides of sulfur and nitrogen into the atmosphere. The impact of these transient pollutants on sensitive persons or species would depend on topographic and meteorological factors, as well as on the amount of each pollutant emitted.

Construction may cause temporary intermittent violations of the National Ambient Air Quality Standard for 24-hour total suspended particulates but would not lead to annual particulate levels above the annual standard. Construction impacts would be temporary and would not need analysis or permitting by air pollution control agencies. Transmission line operation would produce only minor amounts of ozone and oxides of nitrogen from corona reactions.

Terrestrial Wildlife

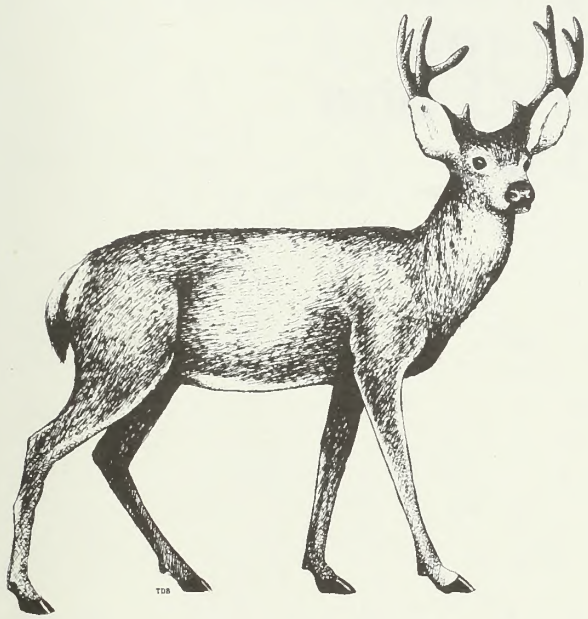
Long-term losses of wildlife or wildlife habitat from the Proposed Action or alternatives would be insignificant because they would represent less than 1 percent of the habitat in the affected areas.

If El Paso adheres to its construction schedule, most direct impacts to wildlife would be avoided and construction disturbances to mule deer winter ranges during critical times of the year would be reduced.

The human and mechanical disturbances of construction could force some local wildlife populations into adjacent areas, causing stress to both dispersed and existing populations. Disturbances within 1 mile of nesting sites could interfere with successful nesting and production of young birds. Temporary access roads and disturbed sites around power poles would encourage the invasion of grasses and forbs that would increase cover and food for Gambel's and scaled quail and other small, nongame birds.

The potential exists for bird losses from collisions with conductors or overhead ground wires but is not expected to be significant because of a lack of bird concentrations along the routes. Electrocution of birds,

especially raptors, is expected to be insignificant if prescribed practices are followed when the towers are built. The towers could provide perching and nesting sites for various types of birds, which would be a beneficial, secondary impact.



Mule deer

Project maintenance roads could be used by persons engaged in illegal shooting of perching or nesting raptors, wanton killing of other species, and illegal hunting of protected game.

Forest Management

The San Agustin Alternative would conflict with the draft Gila National Forest Land Management Plan by crossing an area not designated for utility corridors. Moreover, increased wildfire protection would be needed for the corridor to protect the line, and the use of prescribed fire would need to be modified to assure the safety of workers and the transmission line.

The Gila Alternative would conflict with the draft Gila National Forest Land Management Plan because the existing utilities corridor would have to be widened to allow another transmission line. In addition, this alternative would slightly conflict with the timber harvest and visual management goals outlined in this plan. The alternative would remove 220 acres of timber land from production through vegetation clearing for towers and lines. This clearing of vegetation would reduce the allowable harvest by 25,000 board feet per year. Construction of the transmission line would conflict with the Forest Service application of its Visual Management System. Clearing for tower sites, however, would not significantly change the Forest Service goals for management of forage and wildlife habitat.

AGENCY PREFERRED ALTERNATIVE

The agency preferred alternative is the San Agustin Alternative (B).

CHAPTER 1

Management Framework Plan Amendment/Environmental Impact Statement Process and Description of Proposed Action and Alternatives

CHAPTER 1

MANAGEMENT FRAMEWORK PLAN AMENDMENT/ENVIRONMENTAL IMPACT STATEMENT PROCESS AND DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

INTRODUCTION

On October 4, 1983, the El Paso Electric Company (El Paso) applied to the Bureau of Land Management (BLM) for a right-of-way grant to cross public lands. El Paso proposes to build a 203-mile-long, 345 kilovolt (kV) transmission line from its Luna substation, 1.5 miles north of Deming, New Mexico, to a point on the existing Tucson Electric Power Company (TEPC) transmission line near Red Hill, New Mexico. (See Map 1-1 for location of the transmission line project.) The proposed line would cross 68.5 miles of public land. The right-of-way would be 100 feet wide.

Purpose and Need for Management Framework Plan Amendment/Environmental Impact Statement

The purpose and need of the proposed project are to (1) help reduce dependence on oil and natural gas for generating electricity consumed in the El Paso service territory; (2) furnish access to the energy market economy; (3) enhance system reliability; and (4) help meet El Paso's forecasted need for power by providing firm transmission capacity.

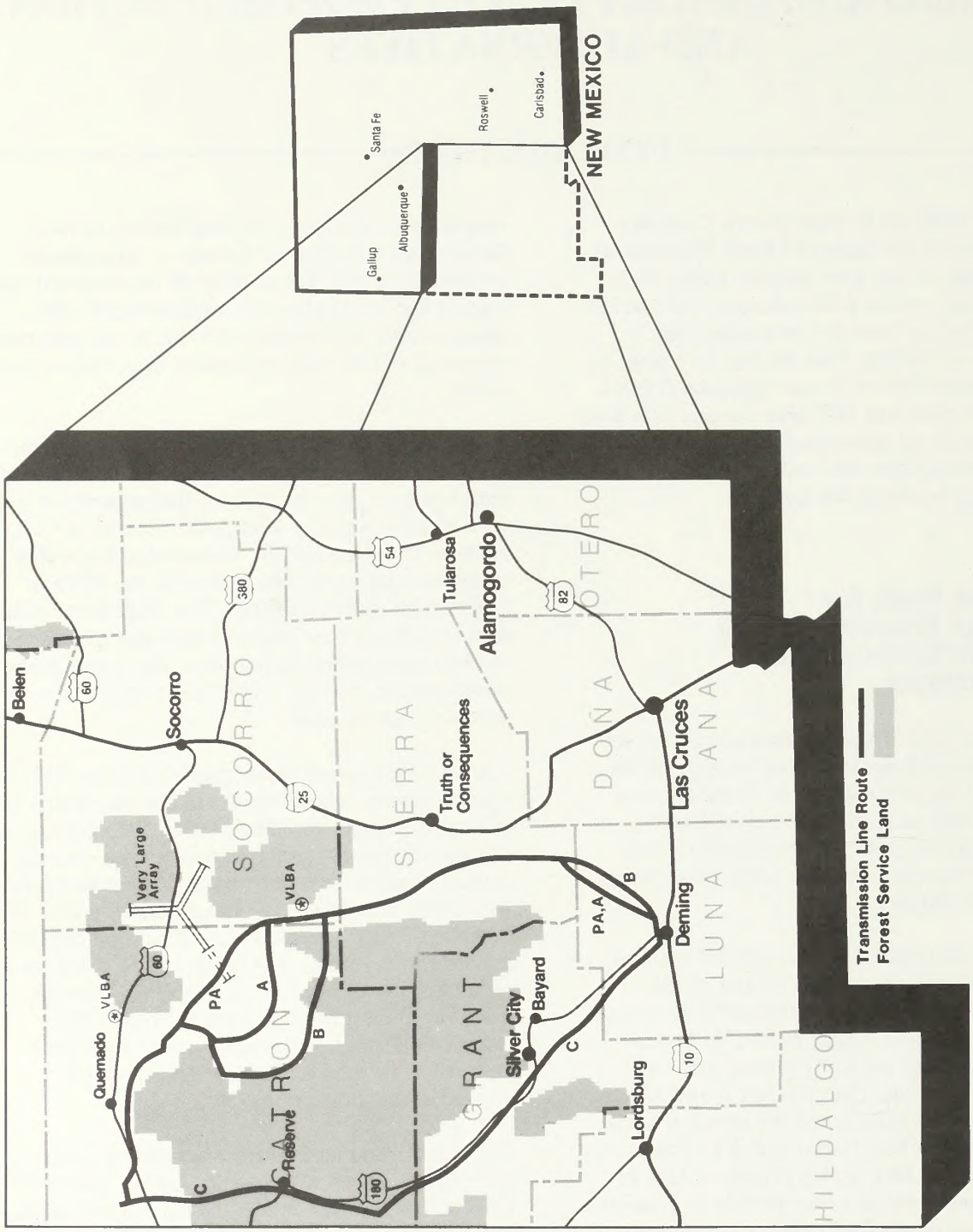
The Powerplant and Industrial Fuel Use Act (PIFUA) of 1978 discourages the use of fuel oil and gas for generating electricity. In the early 1970s, El Paso began working toward a goal to reverse its base generation from 85 percent oil and gas to 75 percent coal and nuclear energy. Therefore, the proposed project would be in accordance with PIFUA and the company's goal by providing access to base load coal and nuclear energy in the western states. Also, during periods of high demand, the proposed project would provide El Paso with lower-cost, non-oil or gas-fired power to replace current energy sources.

The proposed project would provide El Paso with transmission capability for obtaining lower-cost power from Arizona, New Mexico, Utah, and Colorado. If the utility companies serving southern New Mexico increase their imports of energy, the total imports to New Mexico would be reduced because of transmission system constraints. The addition of the proposed transmission line would allow the interconnected utility companies serving southern New Mexico to take more advantage of their existing facilities to provide economic energy.

As El Paso changes from supplying base load power from local sources to supplying base load power from remote sources, the reliability of the transmission system used to carry that base load power becomes critical. The addition of an independent transmission line with a strong external source would increase the El Paso transmission system reliability. The neighboring utilities serving southern New Mexico would also be able to rely on this circuit during emergencies. This is due to the interdependent network of the utility systems serving southern New Mexico.

The proposed project would provide El Paso with increased transfer capabilities (up to 250 megawatts) from sources in Arizona and New Mexico. Firm capacity over existing or planned transmission lines from external sources would be limited to about 400 megawatts between 1984 and 1986, with little available beyond 1986. Although limited, interruptible transmission capacity is available from sources in Arizona and New Mexico and the El Paso system but is not reliable for planning resources to meet forecasted needs. Interruptible transmission capacity that may become available is expected to be substantially less than the amount of contracted and other potential firm power.

The purpose and need of the Management Framework Plan Amendment/Environmental Impact Statement (MFPA/EIS) are to consider the right-of-way application filed by El Paso for the proposed 345 kV transmission line and to analyze potential impacts from El Paso's proposal and all reasonable alternatives. An MFPA/EIS documents the planning and environmental analysis steps that BLM goes through when it sees a possible need to amend an existing land use plan (Management Framework Plan).



Map 1-1 El Paso Transmission Line Project Location Map

Planning Process

The planning process is designed to enable BLM to meet the issues and concerns of the public while complying with the laws and policies established by Congress and the Executive Branch of the Federal Government. The MFPA/EIS process involves nine basic steps and emphasizes the role of public participation at several key stages. The nine planning steps are as follows:

- Identification of Issues
- Development of Planning Criteria
- Inventory and Data Collection
- Analysis of Management Situation
- Formulation of Alternatives
- Estimation of Effects of Alternatives
- Selection of Preferred Alternative
- Selection of Plan Amendment
- Monitoring and Evaluation

IDENTIFICATION OF ISSUES

An amendment to the existing Management Framework Plan is being prepared as a single planning issue document with the EIS to determine which if any public lands within the planning area should be designated as a right-of-way corridor. This issue was developed by BLM specialists and managers together with the public, other federal agencies, and state and local governments for the planning effort. (Refer to Appendix 1 for concerns raised during the scoping process.)

DEVELOPMENT OF PLANNING CRITERIA

After the issue was identified, planning criteria were developed to guide this plan amendment. The criteria were developed from laws, executive orders, regulations, planning principles, national and state BLM guidance, public involvement, and resource information. The regulations for designating criteria for right-of-way corridors are listed in 43 Code of Federal Regulations (CFR) 2806.2. Criteria help to set the standards for data collection, to establish alternatives to be examined, and to select the preferred alternative and final plan. Planning criteria ensure that the plan is tailored to the issue and that unneeded data collection and analysis are avoided. Criteria used in developing this plan are listed in Appendix 1.

INVENTORY AND DATA COLLECTION

Using the planning criteria and focusing on the issue of whether to develop a new right-of-way corridor, BLM specialists identified resource inventory needs and collected data accordingly. The inventories involved data collection, literature searches, and consultation with agencies, organizations, and individuals.

ANALYSIS OF MANAGEMENT SITUATION

The BLM gathered information and evaluated the capability and condition of the physical and biological characteristics of the planning area. This analysis provided the data base for developing and evaluating alternatives.

FORMULATION OF ALTERNATIVES

The MFPA/EIS analyzes potential impacts of the Proposed Action and alternatives. The following alternatives were developed on the basis of the issue (proposed plan amendment) and the concerns raised during scoping (Appendix 1): the Very Large Array Alternative (A), the San Agustin Alternative (B), and the Gila Alternative (C).

In addition, the effects of a No-Action Alternative were analyzed. Other alternatives were initially considered but eliminated from detailed analyses. These alternatives are discussed in the Alternatives Considered but Eliminated section of this chapter.

ESTIMATION OF EFFECTS OF ALTERNATIVES

In accordance with the National Environmental Policy Act, this MFPA/EIS analyzes the physical, biological, economic, and social effects of implementing the Proposed Action or any of the alternatives. See the Summary or Chapter 2 for details.

SELECTION OF PREFERRED ALTERNATIVE

The Preferred Alternative is the San Agustin Alternative (B). Its formulation was based on (l) the issue and concerns identified through the planning process, (2) information obtained from public meetings and letters, (3) formal coordination and consultation with other agencies, (4) decision criteria developed and considered by management, and (5) impact assessments of the alternatives. The BLM Resource Area Managers and the District Manager recommended the Preferred Alternative to the New Mexico State Director, who reviewed the analysis and approved the alternative. The Preferred Alternative along with the other alternatives has been analyzed in this draft MFPA/EIS. The public has 90 days, following the notice of filing with the Environmental Protection Agency (EPA), to review and comment on this draft MFPA/EIS.

SELECTION OF PLAN AMENDMENT

The Resource Area Managers and District Manager will evaluate comments received on the draft MFPA/EIS. Depending on the comments, the managers may reassess or modify the Preferred Alternative or select from among the other alternatives identified in the draft MFPA/EIS. After reviewing the District Manager's recommendation, the BLM New Mexico State Director will file the proposed plan amendment and final EIS with the EPA.

The Governor of the State of New Mexico will be given a 60-day consistency review to allow the state to determine whether the routes analyzed in the final MFPA/EIS are consistent with or conflict with state and local government plans and policies. This review of the final MFPA/EIS will begin when the Governor receives a copy of the camera-ready document.

If no protest is received within 30 days after the final MFPA/EIS is filed, the State Director will select one of the alternatives as the approved plan and publish a Record of Decision. If the selected alternative involves National Forest land, the Regional Forester, Southwest Region, and the State Director will jointly select the alternative and publish a Record of Decision.

The Forest Supervisor, Gila National Forest, has overall responsibility for the management of National Forest Lands and will cooperate with the BLM District Manager, Las Cruces District Office, in evaluating alternatives that may involve National Forest lands.

MONITORING AND EVALUATION

After the Record of Decision is published, intervals and standards for monitoring and evaluating the plan will be established. The intervals will not exceed 5 years. Standards will be developed to determine whether the mitigation measures are satisfactory, assumptions used in the assessment of impacts are correct, or significant changes have occurred in the related plans of other federal, state, or local governments. The information gained will be incorporated into any future planning. During project design, more site-specific analyses will be done by the Forest Service.

Conformance

Because the existing right-of-way corridors designated in the Management Framework Plans for the Hermanas Planning Unit (BLM 1969), Gila Planning Unit (BLM 1968), Southern Rio Grande Planning Area (BLM 1982), and Divide Planning Area (BLM 1982) cannot accommodate a route for the Proposed Action or alternatives, if the decision is made to grant the right-of-way, an amendment will be required. In accordance with BLM planning regulations (43 CFR 1600 Subpart 1610.5), the Proposed Action and alternatives as discussed in this document would require changes in the scope, terms, and conditions of the Management Framework Plan decisions. The planning decision will identify which public land if any should be designated as a right-of-way corridor in accordance with 43 CFR, Subpart 2806.

Consistency with Other Plans

There are no known inconsistencies or conflicts between the proposed project and officially approved and adopted resource-related policies and programs of BLM, other federal agencies, state and local governments, and Indian tribes. However, the Proposed Action would conflict with the expansion plans for the Very Large Array, and the San Agustin and Gila alternatives would conflict with the proposed Gila National Forest Land Management Plan. See Chapter 2, Electromagnetic Interference and Effects and Forest Management sections, for more information.

Authorizing Actions

The proposal would require federal and state authorizations for rights-of-way for the power transmission line. Table 1–1 lists the major authorizing actions that would be needed to build and operate the project. Appendix 2 presents the general measures that will be attached to any of the federal right-of-way grants.

If either the San Agustin (B) or the Gila Alternative (C) is chosen, the decision on granting the right-of-way will require Forest Service approval.

Special Management Areas

The Proposed Action and alternative routes would pass near several areas which are managed under more specific regulations or policy than the rest of the lands crossed. These special management areas, listed on Table 1–2, include wildernesses, wilderness study areas (WSAs), rivers in the Nationwide Rivers Inventory, and a trail corridor in the National Scenic Trails program. The effects to these areas from the Proposed Action and alternatives are detailed in Chapter 2, Wilderness

TABLE 1-1
MAJOR AUTHORIZING ACTIONS
AFFECTING CONSTRUCTION AND OPERATION OF THE TRANSMISSION LINE

Agency	Nature of Action	Authority and (Source)
DEPARTMENT OF THE INTERIOR		
Bureau of Land Management	Grants rights-of-way and issues temporary use permits	Title V of Federal Land Policy and Management Act of 1976, 43 U.S.C. Sections 1761-1771;
	Issues antiquities or archaeological resource permits to excavate or remove archaeological resources on Public Lands	Antiquities Act of 1906, 16 U.S.C. Sections 431-433; Archaeological Resources Protection Act of 1979, 16 U.S.C. Sections 470aa-47011; (43 CFR Part 3)
DEPARTMENT OF TRANSPORTATION		
Federal Aviation Administration	Issues air space permit for airport-related air space determination and air space obstruction clearance for project facilities	Section 1101 of the Federal Aviation Act of 1958, 49 U.S.C. Section 1501; (14 CFR Part 77)
Federal Highway Administration	Issues permit(s) to cross Federal-aid Highways	23 CFR 1.23 and 1.27, and 23 U.S.C. Sections 116, 123, 315; (23 CFR Part 645 Subpart B)
DEPARTMENT OF AGRICULTURE		
Forest Service	Issues special use permit for constructing rights-of-way and facilities	Title V, of the Federal Land Policy and Management Act of 1976, 43 U.S.C. Sections 1761-1771;
	Issues antiquities or archaeological resource permits to excavate and remove archaeological resources on National Forest System Lands	Antiquities Act of 1906, 16 U.S.C. Section 431-433; Archaeological Resources Protection Act of 1979, 16; U.S.C. Sections 470aa-47011; (43 CFR Part 3)
STATE OF NEW MEXICO		
State Highway Department	Issues easements across state highways	New Mexico Dept. of Highways rules and regulations.
State Land Office	Issues easements across state lands	Rules and regulations concerning the sale, lease, and other disposition of State Trust land, Jan. 1984, Rule #10
State Public Utility Commission	Issues a Certificate of Convenience and Need	New Mexico Statutes Annotated, 1978 compilation article 9 the Utility Franchise Sec 62-9-1 New Construction

TABLE 1-2
SPECIAL MANAGEMENT AREAS NEAR THE PROPOSED ACTION AND ALTERNATIVE ROUTES

Special Management Area	Proposed Action	Very Large Array Alternative (A)	San Agustin Alternative (B)	Gila Alternative (C)
Very Large Array*	X	X		
Continental Divide National Scenic Trail Corridor	X	X	X	X
Mesita Blanca WSA	X	X	X	
Eagle Peak WSA	X	X	X	
Cooke's Range WSA	X	X	X	
Continental Divide WSA		X	X	
Horse Mountain WSA		X	X	
San Francisco River				X
Gila River				X
Blue Range Wilderness				X
San Francisco WSA				X
Gila Wilderness				X
Aldo Leopold Vista				X
U.S. Highway 180 Travel Influence Zone				X

*The Very Large Array is not managed by either the BLM or Forest Service but is given similar consideration.

and Recreation sections. See Map 1-2 (inside back pocket of this MFPA/EIS) for locations.

Another area of concern is the Very Large Array (VLA) operated under contract by Associated Universities, Inc., for the National Radio Astronomy Observatory. The $78 million collection of 27 antennas constitutes the world's largest radio telescope. The Proposed Action would pass 8 miles from the VLA, which is located on the Plains of San Agustin 50 miles west of Socorro, New Mexico. The VLA's 27 steerable concave telescopes, each 82 feet in diameter, are distributed along three arms consisting of railroad tracks in the shape of a Y. Two of the arms are 13 miles long; the third is 11.8 miles long. At full extension, the VLA gives the same results as if a single radio telescope, 21 miles in diameter, was used. The VLA is used by astronomers from throughout the world to study the moon, the planets, the sun, near stars, our galaxy, distant galaxies, and the most distant quasars.

The site for this premiere radio astronomical instrument was chosen for several reasons: the flat topography, high altitude, and remoteness, all of which lessen com-

mercial electrical interference; relative freedom from extreme winds; and the southerly latitude, which permits observation of about 75 percent of the sky. The lack of interference was a critical factor in selecting the site of the VLA. The VLA operates at frequencies of 1.5, 4.5, 14, and 22 gigahertz (GHz), and equipment for 327 megahertz (MHz) operation is now being installed. By 1986, the VLA will also be able to operate at 75 MHz. The low frequency development will require lengthening the arms of the VLA, which will increase the size of the area required to be as interference-free as possible.

OVERVIEW OF PROPOSED ACTION AND ALTERNATIVES

General Description and Location

The proposed three-phase, alternating current, 345 kV transmission line supported by wood towers would interconnect the service areas of El Paso and TEPC. The transmission line would begin at the existing Luna substation, north of Deming, New Mexico and extend east and northeast to milepost (MP) 30. From MP 30, the transmission line would go north and northwest to MP 169 and then west to a point on TEPC's existing 345 kV transmission line near Red Hill, New Mexico. The transmission line would be 203 miles long. Each of the three alternative routes would begin and end at the same points. See Map 1-2 for specific locations of the proposed and alternative routes.

Land Status and Ownership

The Proposed Action would involve federal, State of New Mexico, and private lands. Two of the alternative routes would also cross lands administered by the Forest Service. Map 1-2 shows a summary of land ownership for each of the routes.

PROPOSED ACTION

Project Components

TRANSMISSION LINE

The proposed transmission line is intended to operate at a nomimal voltage of 345 kV. About 93 percent of the wood towers would look like the one shown in Figure 1-1. The rest, located at turns and junctions, would be similar but would have slightly different structures.

The transmission line would be a three-phase line. Each phase would be carried on a separate bundle of two conductors. Each conductor would be 795,000 circular mils (over an inch in diameter), made of aluminum strands wound around steel strands; aluminum would carry the electric current and steel would provide strength. The two conductors in the bundle would be spaced vertically 18 inches apart and would be supported in each outside phase position by 5.75-inch by 10-inch suspension insulators. The center or third phase would be in a V-shaped insulator string using two strings of insulators, one attached to each pole, suspending the conductor between the two poles. The wood towers would be made from Douglas fir treated with pentachlorophenol to prevent deterioration from weathering. The conductor attachment height on the tower would average 55 feet aboveground. The clearances to the ground at midspan between two towers would equal or exceed the height required by the National Electrical Safety Code (at least 30 feet). The poles (legs) of a tower would be spaced 26 feet apart; the phase conductor bundles would be spaced 23.5 feet apart.

The span length, or distance between towers, would average 800 feet. Minimum spans of 400 feet and maximum spans of 1,700 feet are possible. About 1,340 towers would be required for the 203-mile-long transmission line, with an average of 6.6 towers per mile. The transmission line conductors would be protected from lightning strikes by two overhead shield wires mounted on the tops of the wood poles and connected by ground wires, copper-wrapped around the bottom of the poles. These overhead shield wires would be 3/8 inch in diameter and made up of seven strands of utility-grade steel.

LUNA SUBSTATION EXPANSION

El Paso proposes to install more substation equipment at the existing Luna substation, north of Deming. The additions would consist of a 345 kV circuit breaker, two

switches, a dead-end tower, and relay equipment. No additional land would be required. The site is protected by an 8-foot-high chain link fence topped by barbed wire.

Communication and control would be provided by a microwave radio system. The existing complex already has the required control house, which would contain electronic equipment and protective relay systems.

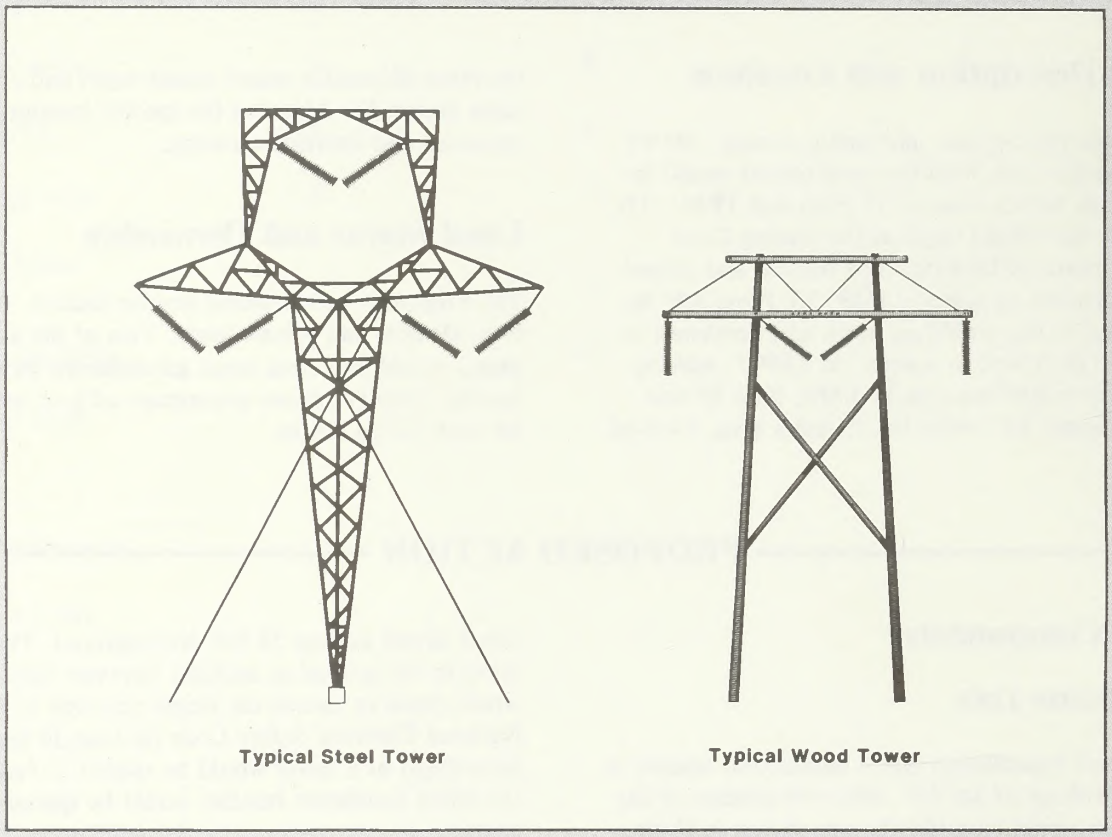


Figure 1-1 Typical Steel and Wood Towers

Construction and Operation

WORKFORCE AND SCHEDULE

The transmission line would be built in two spreads, each consisting of equipment and crews handling the four phases of construction for a given segment of the transmission line. Construction would begin at the middle of the line and work toward either end to allow earlier completion of most activities in the higher elevations. Spread 1 would work from MP 102 to 0 and Spread 2, from MP 102 to 203. About 0.5 mile of line would be built each day by each spread.

Each spread would have 30 to 65 workers to complete the described construction, with a total workforce of 60 to 130. The workforce would begin with about 30 workers per spread. Additions to the workforce would be made at about 2-week intervals until each spread reached a peak of 65 workers. Also, six workers would

be needed to build the Luna substation expansion at Deming.

About 10 percent of this workforce would probably be hired locally. Those not hired locally would probably seek temporary housing in nearby communities and commute daily to the job site (up to 50 miles one way). Many workers have their own trailers and could park them at connection facilities; other workers could rent houses and apartments. Only those supervisors and inspectors who occasionally visit the work site would use motels.

As shown on Figure 1–2, construction from Luna to Red Hill, scheduled to begin in 1986, would require 12 months.

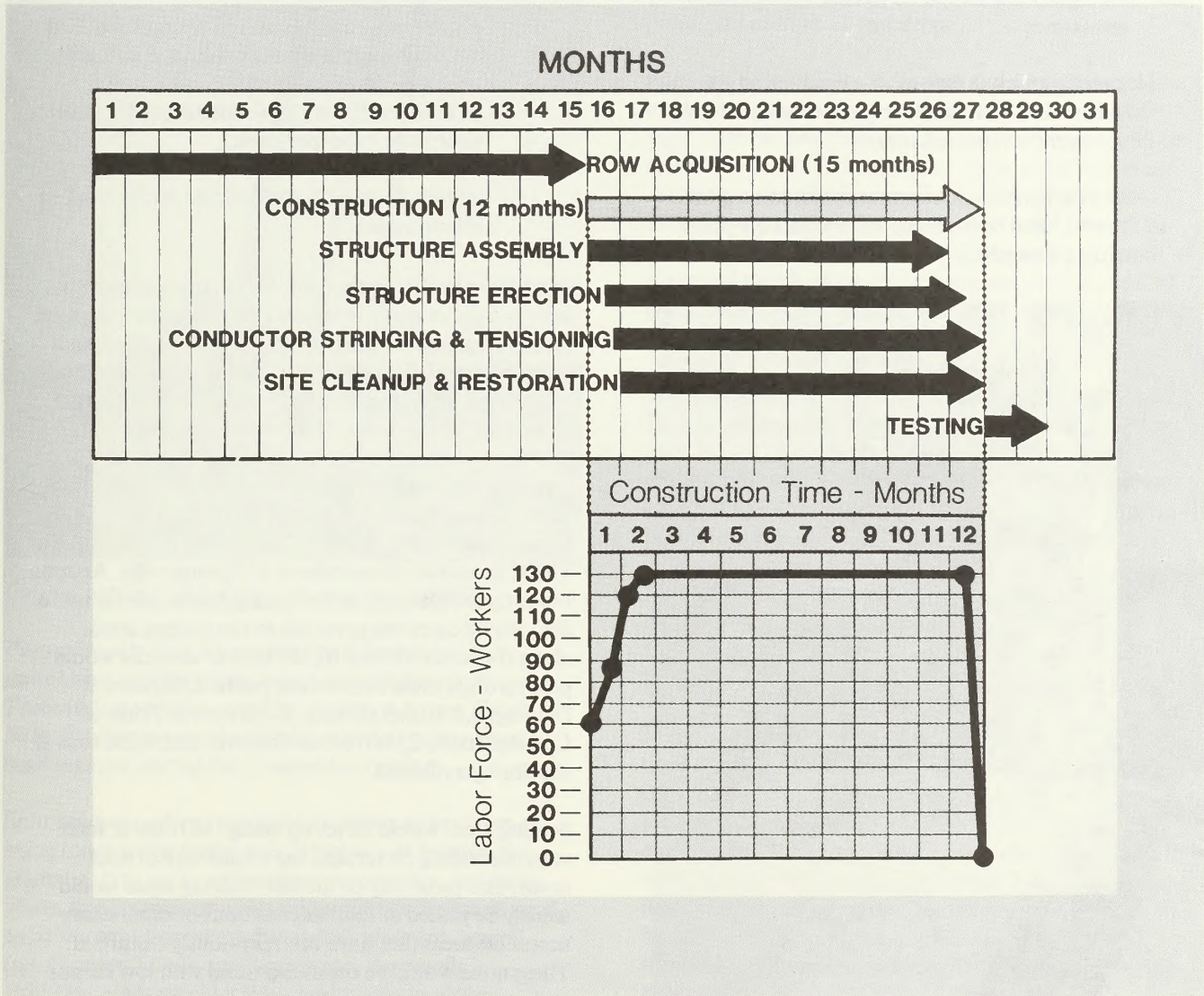


Figure 1–2 El Paso Transmission Line Project Schedule

CONSTRUCTION

The following major types of equipment are normally used in the construction of 345 kV transmission lines:

- wagon drill (mounted on the back of a caterpillar tractor), used to test for rock;
- digger (a drilling rig and auger mounted on the back of a caterpillar tractor), used to dig pole and anchor holes;
- setting ring (crane or large cable rig pulled by a caterpillar tractor), used to raise and set the structures;
- framing truck (a 6x6, or one in which all six wheels drive), used to carry crews and material to assemble the structures;
- air compressor with tamps (mounted on a 6x6 truck), used to tamp the soil around the poles after a structure is in place;

Holes being augered next to the framed structure.

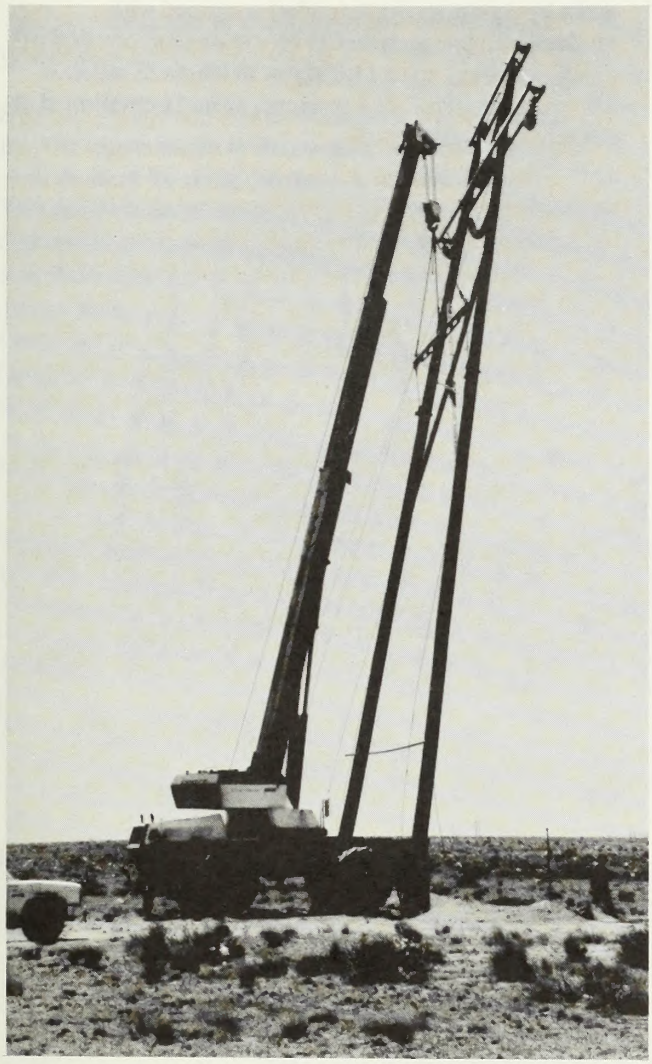
- hauling equipment (large flatbeds and pole trailers pulled with diesel trucks), used for hauling crossarm materials and for pole distribution;
- A-Frames mounted on 6x6 trucks, used for material unloading;
- forklifts, used to unload poles and frame the structures;
- high reach (vehicle equipped with a high lift), used for aerial framing and clipping;
- winch truck, used to realign structures pulled out of alignment during conductor stringing;
- an estimated 15 to 20 pickup trucks for supervisory and other personnel;
- all-terrain vehicles and helicopters for work in rough terrain.

In addition to this equipment, other large equipment, such as a puller and a tensioner, would be used to reach certain structures at the beginning and/or end of each conductor pull. This equipment would also be needed for every dead-end structure. Wire hauling rigs would be required about every 3 miles along the line.

Construction material would be shipped to five storage yards near railheads at Deming, Nutt, Truth or Consequences, and Socorro, New Mexico, and at the TEPC generator site northeast of Springerville, Arizona. From these locations, large hauling trucks, about two a day, would carry the materials to the staging areas along the route. About 16,100 tons of material would pass through these five storage yards: 2,500 tons at Deming; 3,000 tons at Nutt; 4,220 tons at Truth or Consequences; 2,000 tons at Socorro; and 4,380 tons at the Springerville site.

Staging areas would be set up along the route at intervals, depending on terrain, the availability of haul roads, and proximity to the line. Staging areas would usually be placed at road intersections or other easily accessible areas that have been previously disturbed. These areas would be on level ground with low shrubs and grasses or on barren ground so that minimal site preparation would be needed. Clearing would be limited to crushing small shrubs, if needed.

Existing roads would be used wherever possible to carry materials and equipment from the storage yards to the points where they are needed along the right-of-way. El



Crane setting structure in augered holes.

Paso estimates that 20 vehicles could be needed at a given tower site during its 3- to 4-day construction. Three to five vehicles could be present at a time. From 30 to 40 vehicles would probably travel over any given road segment during the construction period.

Spur roads are often required to provide access from existing roads to the tower sites. They would be primitive, graded only in areas with steeper topography, generally where steep escarpments into intermittent drainages need to be smoothed or where dunal drift areas are crossed (see Chapter 2, Soils and Vegetation, for details.) Primitive roads would not be needed where access already exists.

A 70-foot by 100-foot area would be required at each tower site to provide a suitable working surface for equipment and for assembling towers. Depending on the nature of vegetation and terrain, some clearing or leveling would be required to provide a suitable assembly pad. A grader or caterpillar tractor would be used to clear areas for construction roads and assembly pads. Trees or large shrubs would be crushed or trimmed and shredded wherever they interfered with construction. In some cases, where the topography also requires removal, trees and shrubs would be graded and removed.

Explosives would be used to blast rock where it is encountered at pole sites. Where only soil is encountered, a drilling rig and auger, mounted on a caterpillar tractor, would drill the holes into which the poles and anchors for the structures would be placed. These holes would be 3 feet in diameter, only slightly larger than the poles, and average 11 feet deep.

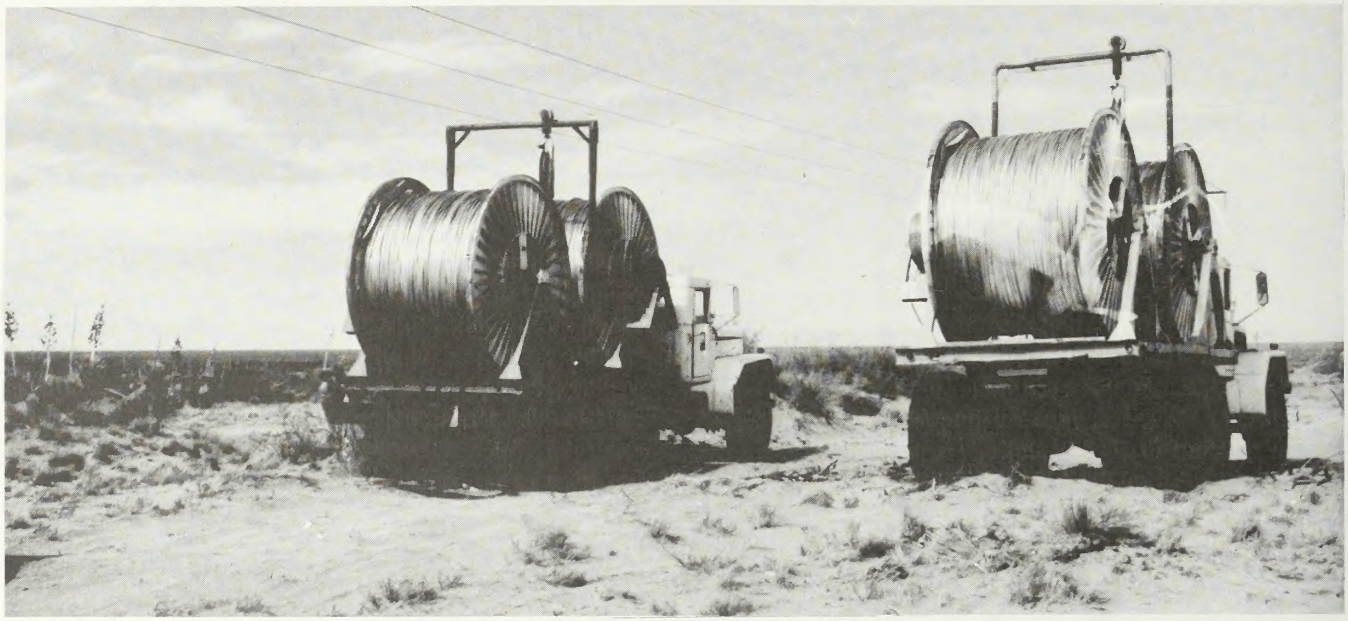
Flatbeds, pole trailers, *A* frames, and forklifts would be used to haul and unload materials along the right-of-way. With the materials on site, the structures would be assembled by the framing crew. These crews would use *A* frames and forklifts to move and adjust material during framing. Pickups or carryalls would be used to transport the larger work crews. The wood poles and structural members would be designed to be assembled into a complete tower at the construction site and raised into position by conventional booms.

The setting crew would follow behind these operations. This crew would use a setting rig pulled by a caterpillar tractor (or a crane mounted on a large flatbed truck), a winch truck, and a compressor truck to set and adjust towers. Once the tower is adjusted, the holes would be backfilled and tamped to firm the tower. The small amount of excess excavated material left after backfilling would be levelled or distributed around the base of the pole. Concrete footings would not be required for wood towers because they would be set deep into the ground.

Metal hardware would be used to fasten the wood structural members to the poles to ensure that the towers met the required structural and mechanical requirements for supporting the conductors. Each tower would be equipped with devices to reduce line vibrations from wind, which could produce mechanical fatigue and possibly cause strands to break. Hardware used to attach the bundle conductors to the insulator string would be smoothly contoured to reduce corona discharge during operation.

After enough towers are set, the shield wires would be strung under tension, sagged, and clipped in (attached to the tower) to give longitudinal stability. The conductors would be installed under tension, using a small tractor to pull a cable or sock line (5/8-inch diameter,

non-twisting steel cable) from tower to tower, and threading it, using tag lines (ropes) which have been previously positioned in the neoprene-covered rollers on the tower cross members. The sock line would then be used to pull the conductor from tower to tower. A truck and a heavy-duty vehicle (puller) equipped with mechanical cable reels would be stationed at one end of a pull extending up to 15,000 feet in length (3 miles). The conductor reels and tensioner would be stationed at the other end of the pull.



Reels of conductor positioned for stringing.

Temporary bridge poles would be erected on both sides of highways and roads. These poles would ensure that the conductor maintained adequate clearance above the roads to allow safe, uninterrupted travel during installation. Flagging personnel would be located at all road crossings. Two conductors would normally be pulled in at the same time. Two 15,000-foot-long conductors could be pulled at a speed of 15 to 20 miles per hour on level terrain. In rough terrain, the speed may be reduced to 3 to 5 miles per hour. This method of stringing line under tension would pose little possibility for dirt, scratches, or other damage to the conductor, holding future operational problems to a minimum in radio and television interference, electromagnetic radiation, corona discharge, and structural integrity. Once the conductor has been fully threaded, a splicing rig would splice the conductors together. Wooden planks are often used to keep the conductor off the ground during splicing.

Compression-type splices would be used to join the conductors between each reel. The special sleeves used in splicing would be inserted over the ends of the conductor and compressed around the two ends to form a good mechanical and electrical connection between the conductors. They would be designed to have smooth surfaces after compression and would be corona-free.

After the conductors are pulled, spliced, and adjusted to the proper tension, they would be clipped in; the conductor bundles would be secured to the insulator strings and the temporary pulleys. Clipping crews usually consist of three workers and a vehicle equipped with a high lift for hoisting the workers and equipment up the towers. Normally, two workers would do the securing on the towers while the third supplied materials to them.

All structure hardware would be grounded, as would all adjacent fences, gates, and similar devices. Where feasible, 8-foot-long rods would be used to ground fences and gates. The butts of all poles would be wrapped using No. 4 copper wire. Down leads on poles would be No. 4 aluminum, splicing to the copper 18 inches above ground level.

If it is necessary to pass through fences, fence strands would be cut and an extra post added to make a permanent gate. All gates would be locked, and only land

users or owners and El Paso inspection crews would have keys.

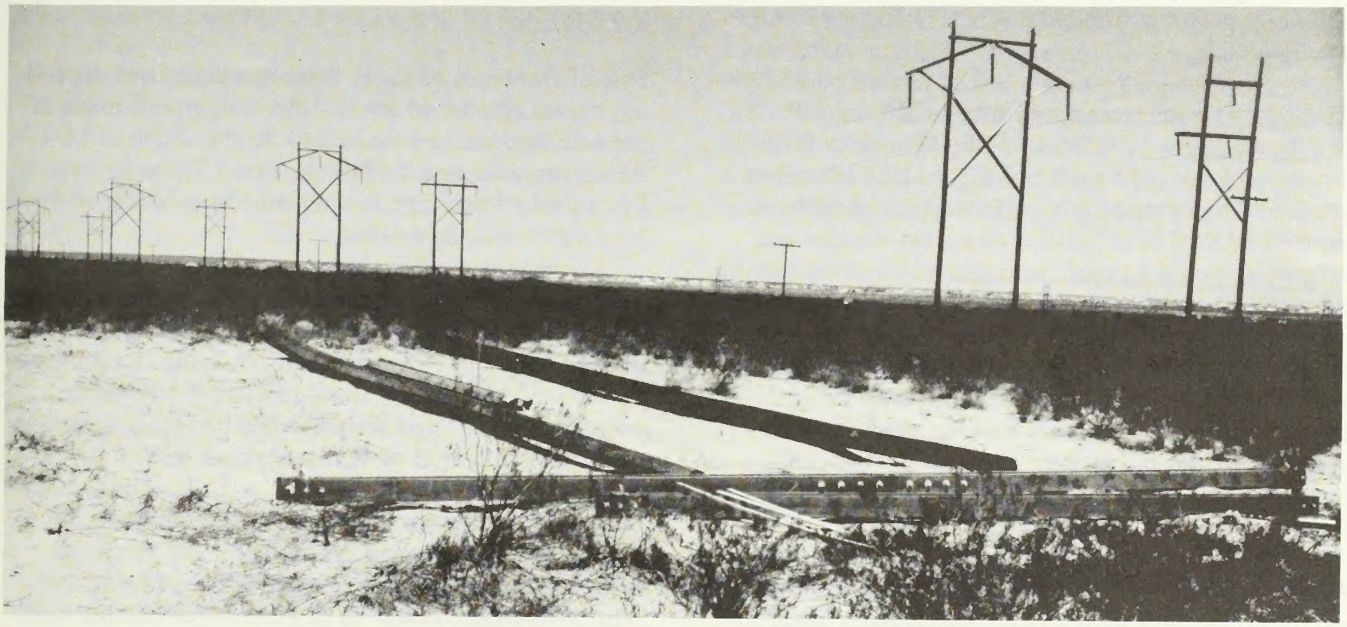
Where the proposed transmission lines crossed a pipeline, the transmission towers would be installed 100 feet or more away from the pipeline. A vertical ground clearance at least 35 feet aboveground would be maintained at these crossings. Techniques for crossing dry, intermittent washes would also be used for rivers crossed by the Gila Alternative route. A rope would be hauled across by vehicle or helicopter and secured. The rope would later be used to haul a cable across that would pull the conductor.

El Paso does not plan to build any transmission facilities or road crossing fills that could result in dredged or fill materials being placed in rivers or streams.

BLM estimates that materials, construction, and right-of-way acquisition costs for the Proposed Action would be $32,884,000 or an average of $162,000 per mile.

OPERATION AND MAINTENANCE

After construction, helicopters or all-terrain vehicles would be used for routine patrols (every 6 weeks) and for any tower line maintenance. Maintenance would depend on the patrol findings; little is anticipated. Generally, tower maintenance would require equipment having a high reach (a vehicle to lift persons up to the towers) and a few pickup trucks. These vehicles would use existing roads where possible, traveling over land and on the two-track road only when necessary. In rough terrain, maintenance would be done using helicopters.



Material laying on graded framing pad.

VERY LARGE ARRAY ALTERNATIVE (A)

This alternative route would begin at Deming, New Mexico and follow the Proposed Action route to MP 110 where it would turn west and then north to rejoin the Proposed Action route at MP 148.3 (MP 160.3A). See Map 1-2 for the route and mileposts. From MP 148.3 of the Proposed Action route to its end at Red Hill, the alternative would follow the Proposed Action route. The Very Large Array Alternative route would be 215 miles long and would use about 1,420 wood towers.

The alternative transmission line would also consist of wood towers and be built using conventional equipment. Storage yards would be the same as for the Proposed Action, with materials distributed as follows: 2,655 tons at Deming; 3,186 tons at Nutt; 4,482 tons at Truth or Consequences; 2,125 tons at Socorro; and 4,652 tons at Springerville for a total of 17,100 tons.

There would be two construction spreads: Spread 1, from MP 107A to 0A and Spread 2, from MP 107A to

MP 215A (108 miles). Construction would progress an average of 0.5 mile per day per spread, beginning at the center of the line and working toward each end. Peak employment for this alternative would be the same as for the Proposed Action.

BLM estimates that materials, construction, and right-of-way acquisition costs for the Very Large Array Alternative would be $34,357,000 or an average of $159,800 per mile.

SAN AGUSTIN ALTERNATIVE (B)

The 228-mile-long San Agustin Alternative would start at Deming; leave the Proposed Action route at MP 3.6; parallel it to the south; follow the existing power line, road, and railroad; and rejoin the Proposed Action route at MP 30.8 (MP 32.3B). The alternative would leave the Proposed Action route at MP 95.5 (MP 97B) and swing west through the higher country to avoid the Plains of San Agustin. It would rejoin the Proposed Action alignment at MP 148.3 (MP 173.3B), following it to Red Hill.

About 1,140 wood towers would be used from MP 0B to 97B, and from MP 152B to 228B (173 miles). Steel towers would be used from MP 97B to 152B (55 miles) because of topographic and engineering constraints. As required by the Forest Service, all-terrain vehicles and helicoptors would be used for construction along the more rugged stretches.

Steel towers (Figure 1–1) differ somewhat from wood towers. The towers for the alternative would be galvanized steel guyed towers with the conductors arranged in a delta or equilateral triangle configuration. Typical towers would be 75 feet wide and 130 feet high. To provide safe clearances between the energized conductors in the air and persons on the ground, the conductors would be at least 35 feet aboveground. Where the terrain dictated, or where the transmission line crossed highways, railroads, telephone lines, or other power lines, more upright sections would be added to the towers to maintain the minimum conductor clearances as specified by the National Safety Code. Maintaining this clearance would allow safe use of the area under the transmission line.

The towers would be designed in sections so that they could be assembled at the site. One section would be the vertical steel column that is the main body of the tower. The other section would be the superstructure that would support the phase conductors and overhead shield wires. With this sectional design concept, the towers could be erected using conventional booms or helicopters. The time and workers needed for tower assembly would be reduced by designing the tower to have interchangeable pieces and sections. Each tower would be supported by four galvanized steel guy wires anchored to the ground in a square pattern, 100 feet to a side. Two types of anchors would be used, as appropriate, for each of the four guy wires on each tower. One type of anchor would be made of pre-cast, steel-reinforced concrete, 18 inches in diameter, made to fit into holes 14 to 16 feet deep. A second type would be all steel and would be inserted by twisting into the ground.

One of two types of tower bases would be used depending on soil conditions at each site. One type is made of pre-cast concrete and tapered to fit into a hole, 3 to 4 feet in diameter and 8 to 12 feet deep. The other type has a steel grillage type footing either 4 by 4 feet or 5 by 5 feet below the surface.

Towers would typically be spaced 1,200 feet apart and no farther than 2,000 feet apart. The longer spans would be used to cross canyon areas. Long spans would be followed by adjacent spans that are shorter than usual. About 220 steel towers would be required for 55 miles, for an average of four towers per mile.

Splicers and safety grounding would be similar to the wood tower construction described for the Proposed Action. Conductor bundles would also be similar, except the wire size would be larger: 954,000 circular mils.

The storage yards for the San Agustin Alternative would be the same as for the Proposed Action, with material distributed as follows: 2,600 tons at Deming; 3,120 tons at Nutt; 4,389 tons at Truth or Consequences; 2,081 tons at Socorro; and 4,555 tons at Springerville for a total of 16,745 tons.

There would be two construction spreads: Spread 1 from MP 114B to MP 0B and Spread 2 from MP 114B to 228B (114 miles). Construction would progress at an average of 0.5 mile per spread per day, beginning at the center of the line and working toward each end. The peak workforce would consist of 65 workers on Spread 1, 80 workers on Spread 2, and 6 workers for the expansion of the Luna substation at Deming. The San Agustin Alternative would conflict with the proposed

Forest Service Gila National Forest Management Plan. (See Chapter 2, Forest Management section, for details.)

BLM estimates that materials, construction, and right-of-way acquisition costs for the San Agustin Alternative would be $42,854,000 or an average of $188,000 per mile.

GILA ALTERNATIVE (C)

The 173-mile-long Gila Alternative route would start at the substation near Deming, but unlike the Proposed Action and the Very Large Array and San Agustin alternatives, it would head northwest for 104 miles to intersect TEPC's existing north-south lines. From that point it would head north, following the two existing lines for 69 miles to the Red Hill site. Where the Gila Alternative paralleled the two existing lines on National Forest System lands, it would be considered a new corridor since the two TEPC lines already fill the corridor.

From MP 0C to 90C, the line would be built using about 600 wood towers; the remainder of the line would be built using 330 steel towers. Splicers and conductor bundles would be similar to those described for the Proposed Action and San Agustin Alternative. Conventional methods, all-terrain vehicles, and helicopters would be used for construction within the National Forest, depending on topography and soils.

Storage yards would be located at Deming and Springerville. Material would be distributed as follows: 4,565 tons through Deming and 7,138 tons passing through the Springerville yard for a total of 11,703 tons.

There would be two construction spreads: Spread 1 from MP 90C to 0C, and Spread 2 from MP 90C to 173C (83 miles). Construction would progress at an average of 0.5 mile per day per spread, beginning at MP 90C and working toward each end. The peak workforce would consist of 65 workers on Spread 1, 100 workers on Spread 2, and 6 workers for the expansion of the Luna substation at Deming. The Gila Alternative would conflict with the proposed Forest Service Gila National Forest Management Plan. (See Chapter 2, Forest Management, for details.)

BLM estimates that materials, construction, and right-of-way acquisition costs for the Gila Alternative would be $40,068,000 or an average of $231,600 per mile.

NO-ACTION ALTERNATIVE

The No-Action Alternative would deny the requested right-of-way for the 345 kV transmission line, which means that El Paso would not build transmission facilities between TEPC's coal-fired generating plant near Springerville, Arizona and the El Paso system. The No-Action Alternative is inconsistent with economic development plans and policies to provide a dependable source of electricity for the region.

ALTERNATIVES CONSIDERED BUT ELIMINATED

Toward achieving its goal of fuel diversification, El Paso identified three sources of power not fueled by oil or natural gas: the Four Corners–San Juan area in the Public Service Company of New Mexico system, the Springerville–Coronado–Cholla area in the TEPC system, and the Palo Verde nuclear generating station in the Arizona Public Service Company system. El Paso considered several general paths from these sources to its system.

Source	Route	Length in Miles
Four Corners	Four Corners–Albuquerque–Alamogordo–El Paso	410
Springerville	Springerville–Albuquerque–Alamogordo–El Paso	405
Palo Verde	Palo Verde–Deming–El Paso	500
Springerville	Springerville–Deming–El Paso	290

In addition, the following alternatives were considered but eliminated after preliminary evaluation:

Greenlee to Deming Alternative—involved using the existing BLM corridor from Greenlee to Deming and purchasing power from the Greenlee substation.

TEPC Upgrading Alternative—involved using the existing TEPC transmission line and upgrading it to two circuits.

TEPC's Vacant Circuit Alternative—involved using the vacant circuit on TEPC's transmission line, which is under construction.

These alternatives were eliminated because TEPC plans to fully obligate its transmission lines through the Forest Service corridor. In addition, El Paso already has a contract to purchase power from the Springerville substation.

El Paso also eliminated an alternative that would have established a coal-fired generating plant. The establishment of a local coal-fired generating plant would have further diversified El Paso's fuel mix and lessened its dependence on expensive, non-renewable petroleum fuels. However, the plant would not be needed until the late 1990s since existing and planned electrical generating capacity appears to be adequate to supply reliable electric service to El Paso's customers. In addition, the plant would cause a greater financial impact to El Paso, would lock in the range of costs to generate power, and could not provide the flexibility offered by the proposed project.

DATA SUMMARY

The Proposed Action and the alternatives would each temporarily (during construction) disturb some of the lands they crossed. Table 1-3 summarizes the total acres that would be disturbed. Four different disturbance rates were used in the calculations, based on the types of materials used and the construction locations. Each construction method would disturb a different number of acres per mile as shown on Table 1-4. (Table 1-5 shows the calculations used in determining the disturbance rates.)

TABLE 1-3
*ACRES OF DISTURBANCE FROM PROJECT CONSTRUCTION**

Project Alternative	Acres of Disturbance
Proposed Action	609
Very Large Array Alternative (A)	645
San Agustin Alternative (B)	717
Gila Alternative (C)	464

*Short-term disturbance (1 year). An unquantifiable amount of scattered disturbance would also occur from periodic maintenance.

TABLE 1-4
DISTURBANCE RATES

Tower Construction Type by Component		Acres per Mile
1. Wood tower construction in relatively new areas would disturb 3 acres per mile.		
Tower Pads—A 70-foot by 100-foot tower pad, 6.6 towers per mile:		1.0
Access Roads—A 12-foot-wide primitive road:		1.5
Side Access Roads—Based on the smooth terrain, 1/3 mile of side access road would be needed for every 1 mile of transmission line:		0.5
	TOTAL:	3.0
2. Wood tower construction paralleling an existing transmission line and road.		
Tower Pads—A 70-foot by 100-foot tower pad, 6.6 towers per mile:		1.0
Access Roads—With the existing roads little new disturbance would be required:		0.5
Side Access Roads—Based on smooth terrain, 1/3 mile of side access road would be needed for every mile of transmission line:		0.5
	TOTAL:	2.0
3. Steel tower construction in timberland:		
Tower Pads—A 70-foot by 100-foot tower pad, 6.6 towers per mile:		1.0
Access Roads—12 feet wide, in rougher terrain:		2.0
Side Roads—12 feet wide in rough terrain:		1.0
	TOTAL:	4.0
4. Steel tower construction paralleling existing power line(s):		
Tower Pads—A 70-foot by 100-foot tower pad, 6.6 towers per mile:		1.0
Access Roads—Few roads if any would be built:		0.5
Side Access Roads—Based on smooth terrain, 1/3 mile of side access road would be needed for every mile of transmission line:		0.5
	TOTAL:	2.0

TABLE 1-5
CALCULATIONS OF ACRES DISTURBED

Route	Total Acres
Proposed Action	
MP 0 to 203, wood tower construction in new areas, 3 acres per mile disturbance:	609
Very Large Array Alternative (A)	
MP 0A to 215A, wood tower construction in new areas, 3 acres per mile disturbance:	645
San Agustin Alternative(B)	
MP 0B to 4B wood tower construction in new areas, 3 acres per mile disturbance:	12
MP 4B to 26B, wood tower construction paralleling an existing power line, 2 acres per mile disturbance:	44
MP 26B to 97B, wood tower construction in new areas, 3 acres per mile disturbance:	213
MP 97B to 152B, steel tower construction in new areas, 4 acres per mile disturbance:	220
MP 152B to 228B, wood tower construction in new areas, 3 acres per mile disturbance:	228
TOTAL:	717
Gila Alternative (C)	
MP 0C to 90C, wood tower construction in new areas, 3 acres per mile disturbance:	270
MP 90C to 104C, steel towers in new areas, 4 acres per mile disturbance:	56
MP 104C to 173C, steel tower paralleling existing power line, 2 acres per mile disturbance:	138
TOTAL:	464

NOTE: It was assumed that no acres would be removed for the life of the project except for an insignificant amount occupied by the towers. Although periodic maintenance would occur, the locations, frequency, and amount of redisturbance are unknown but thought to be low. Therefore, no acres have been calculated.

CHAPTER 2

Affected Environment and Environmental Consequences

CHAPTER 2

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

The affected environment and environmental consequences of implementing the Proposed Action and alternatives are discussed in this chapter. The affected environment is defined as the baseline conditions that would be affected by the proposed project. Baseline conditions assume that normal growth and changes are occurring in the study area. The affected environment varies for individual environmental elements depending on how far-reaching the significant, direct and indirect impacts (environmental consequences) of the proposed project would be for each element.

Impacts to the following resources are not discussed in this chapter because they would not be significantly affected by construction or operation of the Proposed Action or alternatives:

- Water resources, fossil and geological resources, cropland, aquatic wildlife; and
- Threatened and endangered species. No known federally listed or proposed plant or animal species or critical habitats occur along any of the proposed routes. In addition, no state-listed or proposed threatened or endangered animal species would be affected by any of the routes. Six plant species are listed by the State of New Mexico as taxa of concern that could occur on or along some or all of the routes. Once a route has been chosen and a staked line established, surveys should be carried out for state-listed threatened and endangered species. This survey should be coordinated with the Natural Resources Department, Resources Management and Development Division. (See letters from Fish and Wildlife Service and the State of New Mexico, Appendix 3.)

Since no federally listed or proposed species occur along any of the proposed routes, formal Section 7 consultation with the Fish and Wildlife Service is not required. The candidate species listed in Appendix 3 should be considered in future planning, however.

Since impacts to air quality and electromagnetic effects from the alternatives would be similar to those described for the Proposed Action, no separate discussions appear under the alternative sections of this chapter. Impacts to transportation networks from the Very Large Array Alternative would be the same as described for the Proposed Action; therefore, transportation is not discussed under this alternative.

Impacts to Forest Management would not occur from implementing the Proposed Action or Very Large Array Alternative. However, impacts would occur from implementing the San Agustin or Gila Alternative; therefore, Forest Management is discussed for these alternatives. Conflicts with other land use plans or policies are addressed in Chapter 1, Consistency with other Plans.

The impact analyses assume certain types of mitigation, determined by the Bureau of Land Management (BLM) and Forest Service, would be implemented that would ease or reduce adverse impacts. These types of mitigation include mitigation measures incorporated into the applicant's proposed plan of operations. These measures are committed to by the applicant and described in Appendix 2.

PROPOSED ACTION

Electromagnetic Interference and Effects

SIGNIFICANCE CRITERIA

Impacts were considered significant if:

- The electromagnetic interference generated by the proposed power transmission line in the 75 megahertz (MHz) band was received at any

Very Large Array (VLA) antenna at or above the harmful threshold level of −260 decibels above 1 watt per square meter per hertz (dBW/m²/Hz); or

- the interference in the 75 MHz band was received at any Very Long Baseline Array (VLBA) antenna at or above the harmful threshold level of −235 dBW/m²/Hz.

AFFECTED ENVIRONMENT

Electromagnetic Interference.

Very Large Array. The Plains of San Agustin was selected as the location for the VLA because of its flat topography, high altitude, southerly latitude, and freedom from commercial electrical interference.

The VLA presently operates at frequencies of 1.5, 4.5, 14, and 22 gigahertz (GHz). Equipment for 327 MHz operation is being installed. By 1986, the VLA will also be able to operate at 75 MHz. Transmission line interference decreases quite rapidly with frequency; therefore, the impact of the 345 kilovolt (kV) transmission line on the existing VLA should be based upon 75 MHz.

A 13-mile extension of the southwest arm of the VLA is planned for no earlier than the mid-1990s. The antennas on this extension would be fixed and able to operate at 75 MHz.

VLA operations require that local sources of electromagnetic interference (EMI) be minimized. The primary source of EMI to the present VLA operation is vehicular traffic on nearby U.S. Highway 60 and the access roads to the VLA. This source of EMI will become more predominant once the VLA starts operating at 327 and 75 MHz. However, VLA computers can interpret vehicular electrical system EMI data because a vehicle's electrical system generates EMI for only a short time—as a vehicle passes the installation. As long as the interference occurs at short intervals and at different times, the EMI can be detected.

An existing 69 kV overhead power line provides electrical service to the VLA but is not a source of EMI to the present operation—neither from corona nor hardware-generated interference. The 69 kV power line, because of its low voltage, generates essentially no corona. In the future, the line could be a source of EMI at the lower frequencies of 327 MHz and 75 MHz. However, the primary source would be from broken or loose hardware, which can be readily located and corrected. The existing lines are recognized as a possible source of EMI to new VLA operations. Therefore, if necessary, an agreement with local utility companies to quickly locate and correct such interference will be arranged.

Very Long Baseline Array. In 1985, an antenna for the VLBA is planned for location near Pie Town. Plans to locate antennas near Dusty and Bernardo have not been finalized. All three of these antennas would be fixed locations. The final selection of the locations will be based on access to utilities. These antennas, like those of the VLA, would also be able to operate at 75 MHz.

People, Livestock, and Wildlife. Data on the people, livestock, and wildlife in the project area are provided in the Socioeconomic, Livestock Grazing, and Terrestrial Wildlife sections of this chapter. No major electrical transmission facilities are in or near the project area. A 69 kV overhead distribution line, described for the VLA, furnishes electrical service to the VLA.

IMPACTS

Electromagnetic Interference. In terms of radio noise, power lines are considered in two classes: lines below 70 kV and lines above 110 kV. Lines below 70 kV are generally free of conductor corona-type radio noise, and gap-type discharges may be present caused by loose or broken line hardware. If gap-type discharges occurred on the proposed 345 kV transmission line and caused harmful interference to the VLA or VLBA, they could be located and eliminated.

Corona is defined as a luminous discharge caused from ionization of the air surrounding a conductor, around which exists an electric field exceeding a certain critical value. Conductor corona is at its highest during rain or snow and cannot be completely eliminated except at great expense. The utility industry reduces the impact of conductor corona by properly selecting the phase conductors and the width of the right-of-way.

El Paso Electric Company (El Paso) has designed its line to use two 1.108-inch diameter conductors per phase. Data on the conductors, along with the phase spacing, height of the phases aboveground, spacing of subconductors, and voltage of the line, were input into the Bonneville Power Administration (BPA) Corona and Field Effects Computer Program, which was used to calculate the potential interference to the VLA (Chartier 1983; BPA 1982).

To calculate the EMI at 75 MHz, the following worst-case assumptions were made:

- foul weather conditions;
- maximum voltage of 362 kV (the El Paso 345 kV transmission system normally operates at 350 kV);
- flat terrain; and
- altitude of 7,000 feet.

The results of this worst-case EMI calculation at 75 MHz are shown in Figure 2-1, and the methodologies used for these calculations are described in Appendix 4.

Very Large Array. The closest line-of-sight on the Proposed Action transmission line would be at milepost (MP) 117.8, 10.5 miles from the southwest antenna of the VLA. From that point on, the line is shielded by the terrain from any line-of-sight between the antennas and the transmission line. The calculated EMI at the southwest antenna site would be -267 dBW/m²/Hz which, when compared to the threshold value of -260 dBW/m²/Hz, would be less and therefore insignificant. If the VLA antenna sites are extended to the southwest, the line would cross that extension at MP 129.5. This crossing would be within a few hundred feet of a proposed antenna, which would produce up to -186 dBW/m²/Hz, an amount well above the threshold of -260 dBW/m²/Hz. The transmission line would thus cause a significant and a direct interference which could not be mitigated. The Proposed Action would

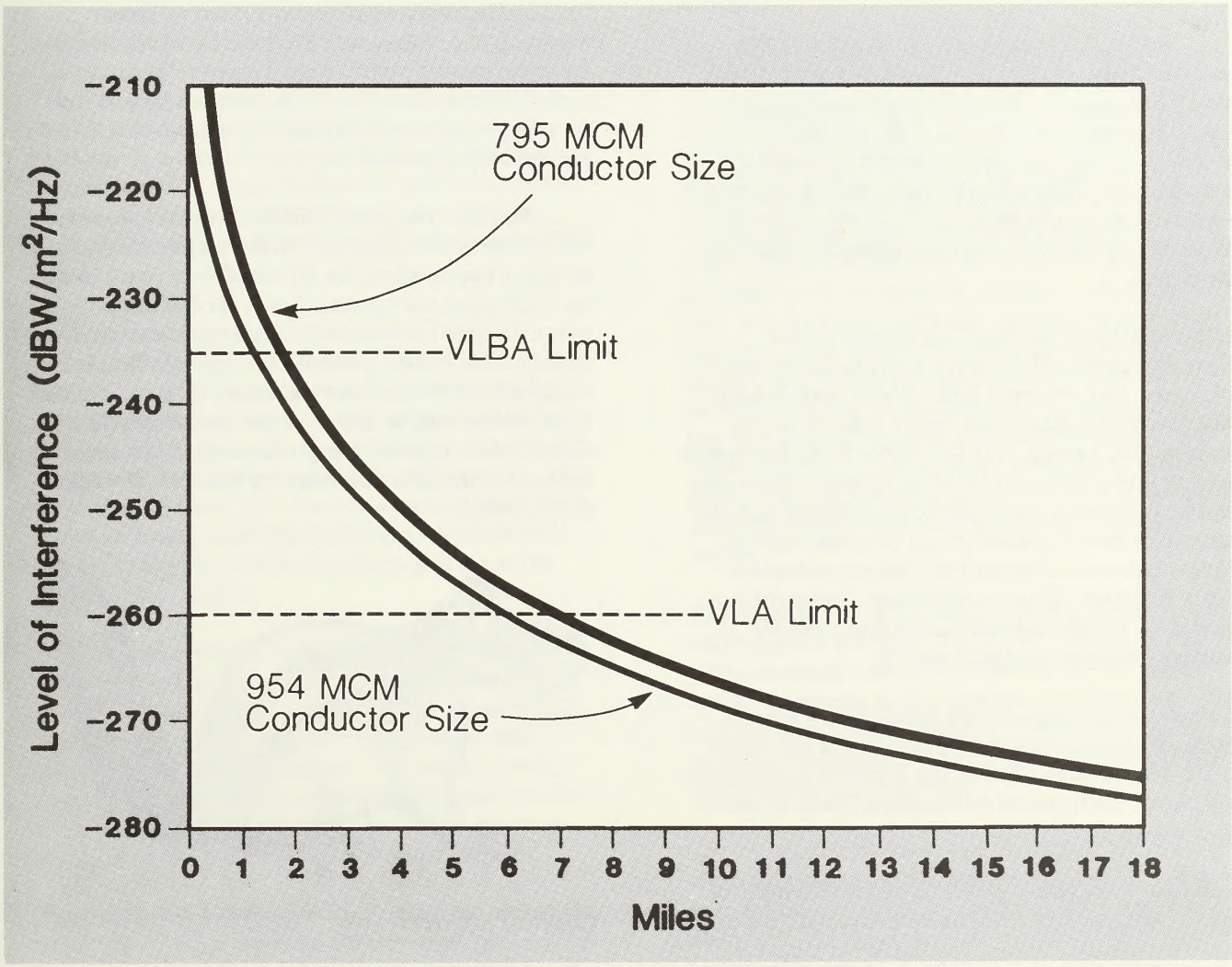


Figure 2-1 Level of Interference Versus Distance from the Source

preclude the extension of the southwest arm of the VLA.

Very Long Baseline Array. Only a general site for the proposed VLBA near Dusty has been selected. From discussion with VLA personnel, the primary criteria for final site selection would be access to utilities, primarily three-phase electrical power. At this time, the siting of the VLBA antenna is flexible.

Using the same worst-case calculation as was used for the VLA, the EMI from the proposed transmission line would be -235 dBW/m^2/Hz (harmful threshold limit) at 9,000 feet from the outside phase of the line. Therefore, if the VLBA was built beyond 9,000 feet, which is the present plan, no impacts from the transmission line would occur.

Electromagnetic Effects.

People. Michaelson (1979) and Mehn (1979) reviewed studies on persons who worked around electrical transmission facilities and concluded that there was no evidence that magnetic or electric fields produced by transmission facilities were detrimental to human health. They believed that symptoms reported in some cases were most likely due to factors other than the electric or magnetic fields (for example, shocks or chemicals).

In the early 1960s, the American Electric Power Company sponsored studies of safety practices, field intensities, body currents, and working environments related to high voltage transmission lines. In one of these studies, a group of 10 line workers who performed hot-line maintenance on 345 kV transmission lines were repeatedly given complete physical examinations at the Johns Hopkins Hospital during a 42-month interval (Kouwenhoven and others 1967; Barnes and others 1967). The study found no significant changes of any kind in the general physical examinations and the workers remained essentially healthy.

The line workers were further observed by a team of physicians over a 9-year period (Singewald and others 1973). The physicians found that exposure to high intensity electric fields caused no long-term health effects to the workers.

Results of more recent studies involving the effects of electric and magnetic fields on humans conducted in Canada, Sweden, Turkey, and the Soviet Union are summarized in ***Electrical and Biological Effects of Transmission Lines: A Review*** (BPA 1982). Only the study in Sweden (Knave and others 1979) indicated a possibility of long-term effects on workers, and caution was recommended in interpretating these preliminary results. Some recent reports have suggested a possible association between magnetic fields and cancer. However, the many studies of line and substation workers and studies of laboratory animals have provided no conclusive evidence that a link between human cancer and electric or magnetic fields exists.

Livestock. The possible biological effect to livestock from transmission line operation was identified as a concern during the scoping process. The transmission line electrical properties of interest included electric and magnetic fields and the effects of corona, such as audible noise. Utility operation experience and results of research generally found that these fields and corona noise have no noticeable effect on livestock behavior or health. Results of several studies on different types of livestock (cattle, sheep, horses, and hogs) are summarized in ***Electrical and Biological Effects of Transmission Lines: A Review*** (BPA 1982). Induced shocks are annoying and would occur. To neutralize induced current, fences, metal buildings, windmill towers, and other large conducting objects near transmission lines are routinely grounded.

Wildlife. Impacts to wildlife from the corona effect and electric or magnetic fields are a possibility, but so little is known about the effects of these phenomena on wildlife that the impacts, if any, are difficult to assess. Current information indicates that adverse effects on wildlife have generally not been significant (Goodwin 1975; Bankoske and others 1976). Although some wildlife may be able to detect transmission line electric fields, research has not determined that these fields adversely affect the behavior or health of wildlife (BPA 1982).

Ground squirrel

Generally, the results of scientific studies of electric and magnetic fields have not shown any noticeable effects

on the health or behavior of humans, livestock, or wildlife from transmission line facilities.

Visual Resources

IMPACT SIGNIFICANCE CRITERIA

Impacts were considered significant if:

- modifications in the landform and vegetation or the addition of a structure did not meet the minimum standards of the BLM Visual Resource Management (VRM) class or the Forest Service Visual Quality Objective (VQO) for the area where the project would be located.

AFFECTED ENVIRONMENT

The Proposed Action would occur within two physiographic provinces containing a characteristic set of landscape features including landform and vegetation (Fenneman 1931). These features are used to determine existing visual values and to determine how changes caused by the Proposed Action would affect these visual values.

The southern and major portion of the Proposed Action, MP 0 to 150, would occur within the Basin and Range province. The province is characterized by flat to gently rolling desert landscape with sparse vegetation cover, changing to rugged mountainous terrain with a variety of forest vegetation. Evidence of human occupancy is scattered, with occasional communities or rural residences, associated facilities, a few roads and highways, and the VLA in the eastern portion of the Plains of San Agustin.

The northern quarter of the proposed route would enter the Colorado Plateaus physiographic province at about MP 150. The area is characterized by flat to gently rolling landscape covered by desert shrub species and pinyon-juniper, with occasional, well-defined, steep, forested mountains. Cultural modifications are few but include state and local highways and roads, and occasional ranch headquarters and associated facilities.

The established VRM classes for the affected area relate to the physical characteristics of the physiographic provinces previously described and viewing conditions such as visual sensitivity and viewing distance. See Appendix 5, Visual Resource Management Methodologies, for more explanation of concepts and terms.

The Proposed Action would cross VRM classes II, III, and IV. Table 2–1 summarizes the existing areas for each class, by milepost, that would be crossed by the transmission line route. The Proposed Action would cross 32 miles of VRM Class II areas, which are generally around and south of the Cooke Range, in the Nutt area, and in the Plains of San Agustin.

Class II areas generally correspond to the most visually sensitive and highly scenic portion of the proposed route. VRM Class III areas are located between Deming and Nutt, in the lowlands north of Winston, south of Omega, and in the Red Hill cinder cone area. The Proposed Action would cross 62.5 miles of VRM Class III areas. The project would cross 108.5 miles of Class IV areas, which include all of the remaining areas that are generally unseen by the public or that have landscape features that are less diverse (BLM 1981, 1982, 1983a).

The Plains of San Agustin area has been classified as VRM Class II because of its high visual sensitivity to local residents and travelers through the area (BLM 1982). The landscape has been interpreted as displaying high scenic quality because of the unique geomorphological feature composed of an old lake bed that is visually enclosed by the surrounding mountains. The near-natural appearance of the landscape is only subtly modified by the harmonious presence of ranching facilities, such as fences, windmills, and headquarter buildings. The VLA visually dominates the eastern portions of the Plains of San Agustin in terms of scale with the natural landscape. By comparison, the apparent scale of the VLA facilities tends to dominate the natural landscape elements in the observer's foreground, middleground, and background views. The VLA, although interesting to most viewers, creates an adverse visual impact.

The concepts contained in the Contrast Rating System, which analyze contrasts in form, line, color, and texture of the landscape and the duration before the impact would be reduced to an acceptable condition, were used to determine the significance of impacts. This rating system is summarized in Appendix 5, Visual Resource Management Methodologies.

The visual contrast was evaluated only for the residual effects of placing the transmission line on the landscape as an introduced structure. Surface scars to landform and vegetation removed during construction of the transmission line have not been evaluated. Most of the surface disturbances would result from constructing additional access roads, which are not presently defined, or placing towers in steep terrain; vegetation removal

would be minimal in most locations and not easily seen from most viewing points. Since the towers and conductors would be visible for the life of the project, the impact analysis focused only on the addition of structures.

Construction crews and equipment would be visible only temporarily and, therefore, would not have a significant impact on the visual resources of the area. Changes that would occur during construction are considered temporary and short term and, therefore, insignificant.

TABLE 2-1
TOTAL MILES OF VISUAL RESOURCE MANAGEMENT CLASSES AFFECTED BY THE PROPOSED ACTION

Milepost	Number of Miles	Class II	Class III	Class IV
0.0- 7.5	7.5		7.5	
7.5- 9.5	2.0	2.0		
9.5- 2.0	2.5			2.5
12.0- 13.5	1.5	1.5		
13.5- 29.0	15.5		15.5	
29.0- 33.0	4.0	4.0		
33.0- 49.0	16.0			16.0
49.0- 53.0	4.0		4.0	
53.0- 82.0	29.0			29.0
82.0- 94.5	12.5		12.5	
94.5-106.0	11.5			11.5
106.0-112.5	6.5		6.5	
112.5-115.5	3.0			3.0
115.5-140.0	24.5	24.5		
140.0-162.5	22.5			22.5
162.5-169.5	7.0		7.0	
169.5-182.0	12.5			12.5
182.0-183.0	1.0		1.0	
183.0-185.5	2.5			2.5
185.5-189.0	3.5		3.5	
189.0-191.0	2.0			2.0
191.0-195.0	4.0		4.0	
195.0-199.0	4.0			4.0
199.0-200.0	1.0		1.0	
200.0-203.0	3.0			3.0
(End)				
TOTAL:	203.0	32.0	62.5	108.5

Refer to Appendix 5, Visual Resource Management Methodologies, for definitions of terms.

Changes that would be evident throughout the life of the project and beyond would be considered long term.

Primary long-term impacts from the Proposed Action would result from adding transmission structures and conductors. Visual resource changes that would not meet the standards for the VRM class of the area in which they occur would be considered significant adverse impacts. These impacts are described for the Proposed Action in Table 2-2.

The Proposed Action would significantly affect 28.5 miles of VRM Class II areas, 29.5 miles of Class III areas, and 5 miles of Class IV areas. The primary significant adverse visual resource impacts would result from placing the transmission line upon the natural-

appearing landscape. Generally, the modifications would not meet the standards of the VRM classes for the areas where the project would be located.

Significant impacts are summarized for the following areas of concern: 5.5 miles of the project that would be viewed between Deming and Nutt along U.S. Highway 180 and New Mexico State Highway 26; 27 miles viewed from State Highways 27, 90, 52, and 59 and from local residences and ranches toward the Black Range; 26.5 miles within the extremely visually sensitive Plains of San Agustin where the transmission line would dominate and depreciate the scenic value of the near-natural and unique landscape; and 10.5 miles along the route that would cross other areas of high scenic quality. The impacts from where the route crossed U.S. Highway 60 would most likely be insignificant since accepted design techniques for project alignment across a highway were used.

TABLE 2-2
SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS CAUSED BY THE PROPOSED ACTION[1]

Milepost	Number of Miles	Existing VRM Class[2]	Primary Viewpoints and Description of Impacts[3]
0–3.5	3.5	III	Viewed from U.S. Highway 180, State Highway 26, rural residences as fg/mg. Would add to cumulative impacts of existing transmission line.
7.5–9.5	2.0	II	Viewed from State Highway 26, local access to ranches and mines as fg/mg. Addition of new structure in natural-appearing landscape would cause contrast in form and line elements.
25–31	2.0 4.0	II III	Viewed from State Highway 27 as fg/mg. Would add elements of form and line to natural-appearing landscape.
50.5–54.5	3.0 1.0	III IV	Viewed from State Highway 90 as fg/mg. Would add elements of form and line to natural-appearing landscape.
82–84	2.0	III	Viewed from State Highway 52 and community of Winston as fg/mg. Contrasts in addition of form and line elements of transmission line, and form, line, color, and textural changes in vegetation removal.
88–96.5	6.5 2.0	III IV	Viewed from State Highway 52 and 59 as fg/mg. Contrasts in elements of form and line in a natural-appearing landscape.
106–112.5	6.5	III	Viewed from State Highway 52 and local ranches as fg/mg. Contrasts in form and line with near-natural landscape.
115.5–142	24.5 2.0	II IV	Viewed from State Highways 78 and 12, and local ranch headquarters as fg/mg and bg. Contrasts in form and line elements of the transmission line would dominate the near-natural landscape of the Plains of San Agustin.

TABLE 2-2 (Concluded)
SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS CAUSED BY THE PROPOSED ACTION[1]

Milepost	Number of Miles	Existing VRM Class[2]	Primary Viewpoints and Description of Impacts[3]
163-167	4.0	III	Viewed from county road along Mangus Creek as fg/mg. Contrasts in elements of form and line, would dominate the existing landscape in terms of scale.

[1]All visual resource impacts would be caused by adding transmission towers and conductors to the landscape, unless otherwise noted.

[2]Refer to Appendix 5, Visual Resource Management Methodologies, for definitions of terms.

[3]All impacts would last for the life of the project—until the transmission line is removed.

Distance zones: fg = foreground; mg = middleground; bg = background; fg/mg = foreground/middleground.

Cultural Resources

IMPACT SIGNIFICANCE CRITERIA

Impacts to cultural resources were considered significant if:

- any information was lost that impeded efforts to explain cultural processes or to reconstruct the prehistory or history of the region; or
- impacts occurred to any cultural resource on or eligible for listing on the National Register of Historic Places.

AFFECTED ENVIRONMENT

An overview study of the project area was performed by reviewing archaeological and historical, written material and records. Summaries of the cultural resources of southwestern New Mexico are found in ***An Archeological Synthesis of South-Central and Southwestern New Mexico*** (Le Blanc and Whalen 1980) and ***Cultural Resources Overview, Socorro Area, New Mexico*** (Berman 1979). ***The Black Range Survey*** (Laumbech and Kirkpatrick 1983) summarizes the cultural resources of western Sierra County.

The Proposed Action area is generally flat to gently rolling, graduating to steep mountainous terrain with a large Pleistocene lakebed (Plains of San Agustin) to the north, falling off into foothill-like areas and finally into basin and range to the south.

Less than 2 percent of the Proposed Action route has been subjected to a Class III inventory. Very little excavation has been done.

The following cultural horizons are represented in the project area: Paleo-Indian, Archaic, Mogollon-Mimbres (early and late Pithouse and Classic periods), Mogollon-Anasazi Contact (northwestern portion of project area near Quemado), Animas, Salado, and Historic.

The Paleo-Indian Horizon is represented only by isolated finds without any known stratified site locations except for a site in the Plains of San Agustin. The site is called the AKE site, after the landowner. However, searches for Paleo-Indian sites within the study area have always been secondary to other cultural studies. Also, many lithic scatters, hearths, and other features having artifacts that cannot be readily identified or dated may in fact be from the Paleo-Indian Horizon. In adjacent and similar surroundings, Paleo-Indian sites have been located in sand dune areas, which are often associated with ancient lakebed shorelines.

Archaic Horizon sites are known from deflated sand dunes, rock shelters, and eroding channels. The numbers of identified sites compared to those likely to exist are low. Most sites are discovered as they become uncovered through the natural processes of erosion.

Cultural resources of Mogollon-Mimbres Horizon are the most visible and best studied in the project area. The Proposed Action route would occupy the heartland of the known classic development of the Mogollon,

represented by a progression from pithouses to masonry pueblos and by development of a distinctive style of pottery design. In the northwestern portions of the Proposed Action route to the north and northwest of Quemado are numerous masonry pueblos of the Developmental and Great Pueblo periods. The pottery of many of these sites shows affiliation to the Anasazi to the north as well as to the Mogollon to the south. This area around Quemado is critical to an understanding of the contact between these two cultures from 400 A.D. through 1340 A.D. Additionally, pithouse village sites of the pre-Mimbres formative periods such as Cerro Colorado are likely to occur in the area around Quemado.

The Animas Horizon is represented by large congregated communities residing in U-shaped adobe structures with plazas. The Mimbres Horizon is unlike the Animas. Material culture of the Animas Horizon is a composite of Mogollon as well as influences from the Hohokam to the west and Anasazi to the north. Animas structures are consistently found near the mouth of side drainages with their confluence with larger drainages or where drainages join valley bottoms.

The Salado represents the final horizon in existence before historic times. The Salado Horizon is characterized by the arrival of Anasazi from the Little Colorado and the Tonto Basin to the north. The Salado people made a red, black, and white polychrome pottery. Salado people buried their dead, without cremation, under the floors of houses. Their architecture consisted of aboveground rectangular compounds constructed of caliche-adobe.

The potential for Historic sites also exists along the transmission line route. The Historic period began with contact among various Puebloan groups and Spanish soldiers and priests. As time passed, Spaniards encountered fewer people and more ruins due to depredations by the Athabascan groups of Apache and Navajo. The American period is represented by military forts associated with Indian conflicts or the Civil War. Also, sheep and cattle ranching as well as mining have left their marks on the landscape. The Magdalena livestock driveway was continually used for moving sheep, horses, and cattle from 1885 through 1970. In 1918, the driveway was formally withdrawn from the public domain to serve the ranching industry. The driveway was 125 miles long, extending from Springerville, Arizona to the railhead at Magdalena. Many spur routes lead into the main driveway. In the 1930s, the Civilian Conservation Corps drilled wells every 10 miles and fenced the route. The Proposed Action route could potentiallly cross early 20th century homestead sites.

The Proposed Action route has been crossed 15 times by cultural resource inventories for seismic tests or right-of-way inventories. Over 39 known cultural sites have been identified within a 1-mile-wide corridor of the Proposed Action route. These sites include unidentified lithic scatters or campsites that may relate to Paleo-Indian or Archaic occupations or to any of the more recent Indian occupations. Identified site types include pueblos, lithic scatters, caves, quarrys, and historic homesites. Four sites are Mogollon. The Proposed Action would cross the Magdalena livestock driveway at MP 132.7. Two sites are associated with the Historic period.

The following sites or classes of sites are either on or determined eligible for listing on the National Register of Historic Places: Mogollon Pueblo (Cox Ranch Pueblo), the Magdalena livestock driveway, Paleo-Indian, Archaic, Mogollon-Mimbres, Anasazi (Chacoan), Animas, and Salado. Areas of high site probability can be found between MP 80 and 106 and between MP 169 and 203.

IMPACTS

Construction of the Proposed Action would cause land disturbance and damage to any cultural resources within the area. Cultural impacts could include destruction or alteration of the resources, displacement of artifacts creating loss of context, and alteration of the surrounding environment. Scientific and cultural information and materials as well as portions of the resource base needed for future research could be lost. Loss of any information could have a significant impact on efforts to answer questions relating to the cultural process and function or toward reconstructing the prehistory and history of the region.

Since the exact location of the project components are unknown, specific impacts cannot be predicted. Using the intensive cultural inventory and compliance procedures described in Appendix 2, significant cultural resource impacts should not occur. However, some indirect impacts to sites along the route could occur from increased access both during and after construction.

Wilderness

IMPACT SIGNIFICANCE CRITERIA

Impacts to the wilderness resource were considered significant if:

- any project component(s) crossed the boundary

of a designated wilderness or area under study for possible designation as wilderness.

AFFECTED ENVIRONMENT

The Proposed Action route would be located 3 miles or less from three BLM-administered WSAs: Mesita Blanca (NM–020–018), Eagle Peak (NM–020–019), and Cooke's Range (NM–030–031). All three WSAs were inventoried and found to have wilderness characteristics. In November 1980, these areas were formally designated as WSAs by the BLM New Mexico State Director (BLM 1980).

Mesita Blanca WSA (Map 1–2). The Mesita Blanca WSA is located on flat to rolling grassland broken by isolated sandstone and basaltic mesas. It is characterized by cliffs and broken topography as well as a large cinder cone (Red Hill) and an associated lava flow (BLM 1980). The southern boundary of the WSA parallels County Road A005, which is a dirt road. Other roads, trails, fences, buildings, gravel pits, and other ranching-related facilities outside the unit may be viewed from within the unit. The existing Tucson Electric Power Company (TEPC) transmission lines are located 10 miles or more from the unit and are generally unseen from the area. The diversity of landforms and extreme isolation of the unit afford visitors an outstanding opportunity to experience solitude. Other recreation experiences include hiking, climbing, and picnicking (Jarvis 1984). As a result of the Secretary of the Interior's Policy Announcement of December 28, 1982 concerning WSAs, the Mesita Blanca WSA was reinventoried and restudied with the analysis published in the ***Las Cruces District Wilderness Final Environmental Assessment, Vol. 1*** (BLM 1984). The draft Environmental Assessment (EA) recommends that the entire 16,429-acre WSA be considered unsuitable for wilderness designation. The Proposed Action would be within 1/8 to 1 mile of the WSA boundary between MP 197 and 200.

Eagle Peak WSA (Map 1–2). The Eagle Peak unit contains well-defined canyons, an extensive labyrinth of sandstone and basalt cliffs, a series of cinder caves, relatively recent lava flows, old growth pinyon-juniper forests, and open grassland. The relatively large size, topographical features, and vegetation diversity of the unit ensure the visitor outstanding opportunities for solitude and primitive recreation (BLM 1980a). The Eagle Peak WSA was reinventoried and restudied (BLM 1984) and a recommendation was made that the entire 32,748-acre WSA be considered unsuitable for wilderness designation. The Proposed Action route would pass within 1/8 mile of the WSA boundary between MP 193 and 195. A dirt road, County Road A007, parallels the southwest boundary of this WSA.

Cooke's Range WSA (Map 1–2). The Cooke's Range WSA includes most of the rugged Cooke Range and surrounding foothills and drainages. Vegetation consists of mountain shrub, pinyon-juniper, and grasses.

The existing cultural modifications in the unit are topographically and vegetatively screened so they do not interfere with the outstanding opportunities for solitude and primitive recreation. Recreation opportunities include backpacking, hiking, hunting, mountain and rock climbing, horseback riding, rock hounding, and sightseeing. The Cooke's Range WSA is being studied through site-specific analysis. The ***Las Cruces District Wilderness Final Environmental Assessment, Vol. 1,*** made a recommendation that the entire 19,608-acre WSA be considered unsuitable for wilderness designation (BLM 1984). The Proposed Action route would pass within 3 miles of the WSA boundary between MP 10 and 20.

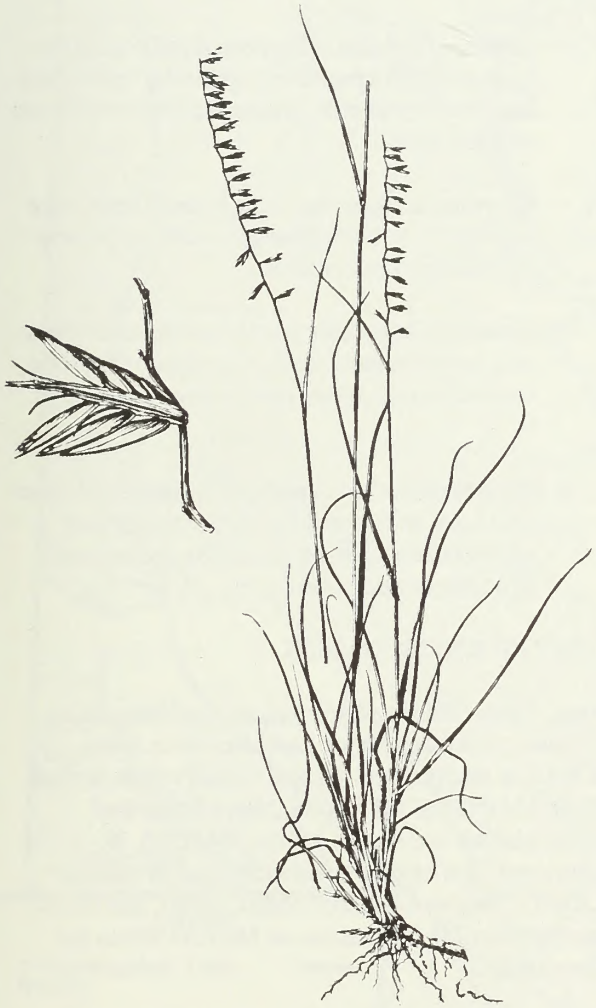
IMPACTS

No significant, direct impacts to the wilderness resource are anticipated as a result of the proposed route crossing the boundary of any unit since no crossings are planned. Construction-related noise and dust impacts would be short term (1 week or less) and, therefore, insignificant.

The transmission line would be visible to the user of the Mesita Blanca and Eagle Peak WSAs. The significance of this impact would depend on the individual perspective or viewpoint of the users. However, BLM policy does not preclude the selection of a project solely because it might create outside sights that may affect a user within a WSA. It is also not the policy of the BLM to create protective buffer zones around wilderness areas, or in this case, potential wilderness areas. Therefore, the fact that nonwilderness activities or uses outside the area could be viewed from within the area should not preclude it from being designated as wilderness, keeping within interim management quidelines (***Federal Register*** 1982).

Mesita Blanca WSA. The existing cultural modifications outside the WSA, but visible from within the unit, are probably not considered as significant impacts to users of the area. The modifications are within the scale of the landscape features; are at a great distance; or generally repeat the forms, lines, colors, and textures of the landscape. However, the Proposed Action would introduce a structural system that would visually dominate

the landscape features for the long term as viewed from the southern portion of the unit near the cinder cone and from higher vantage points in the southern portion of the lava flow. Since the area is predominantly grassland, visitors could easily see the transmission line from the WSA, especially from the higher vantage points. The views would be more evident since the Red Hill cinder cone is a major feature from a recreational, visual, and geological sightseeing standpoint.



Sideoats grama

Eagle Peak WSA. The visible presence of the Proposed Action along the southwest boundary of the WSA would cause the same type of visual disturbance as described for the Mesita Blanca WSA. The effect on the solitude experiences of the user would depend on individual perspective and viewpoint. The view of the transmission line would generally be unobstructed because of open views across the grasslands.

Cooke's Range WSA. The Proposed Action would be placed far enough from the WSA boundary (3 miles) that the intrusion would not visually detract from the unit's naturalness nor diminish its solitude qualities. Generally, the proposed transmission line would have little visual significance from a distance of 2 miles or more. The forms, lines, colors, and textures of the project would tend to blend visually with the landscape elements.

Recreation Resources

IMPACT SIGNIFICANCE CRITERIA

Impacts to recreation resources were considered significant if:

- the quality of recreation opportunities such as sightseeing, hiking, or hunting, were reduced and the public's expectation for quality recreational experiences were diminished;
- any alteration of the natural, cultural, or recreation values of the Gila or San Francisco rivers identified in the Nationwide Rivers Inventory affected any future potential for Wild and Scenic River designation; or
- the scenic or recreation values of the Continental Divide National Scenic Trail Corridor were altered.

AFFECTED ENVIRONMENT

The recreation area of influence includes those lands that would be directly affected by project construction and operation and the recreation resources that would attract project-related population. Common recreation opportunities within the area of influence include sightseeing and touring, off-road vehicle (ORV) use, hiking, hunting, and camping. Generally, recreation use along the Proposed Action route is low.

Probably the most common recreation opportunity that occurs along the Proposed Action route is an unquantifiable amount of sightseeing and touring. The VLA provides an interesting sightseeing area, while the relatively undisturbed Plains of San Agustin also provides high quality, semi-primitive sightseeing opportunities from the road. Since the VLA facility visually dominates the eastern portion of the Plains of San Agustin, it is also an intrusion on the scenic quality, naturalness, and solitude of the Plains. The farther one gets from the VLA, the less effect the installation has

on recreation opportunities in the area. Some horseback riding also occurs in the Plains of San Agustin. The Proposed Action route would cross the Plains of San Agustin between MP 115 and 140 (Map 1-2).

The National Parks and Recreation Act of 1978 (Public Law 95-625) formally designated the Continental Divide National Scenic Trail (CDNST) and directed that the trail be administered by the Secretary of Agriculture in consultation with the Secretary of the Interior. The Rocky Mountain Region of the Forest Service has completed the most planning work and in some cases identified route alignments or paths across various National Forests within a 100-mile-wide corridor. Using its land management planning process and subsequent recreation activity plans (Fellows 1984), BLM intends to identify various alignments across public lands. Currently, the CDNST study corridor extends 50 miles on either side of the Continental Divide.

The Continental Divide National Scenic Trail Comprehensive Plan Environmental Assessment Decision Notice and FONSI (FS 1981a) provides more details about the trail corridor. The Proposed Action route would cross the CDNST corridor three times: near MP 5; near MP 156, north of Deming; and near MP 176, south of Quemado (Map 1-2).

The Mesita Blanca, Cooke's Range, and Eagle Peak WSAs offer many recreational opportunities because of their scenic qualities, solitude, and naturalness. See the Wilderness section for more discussion.

IMPACTS

Placing the proposed transmission line in the relatively semi-primitive Plains of San Agustin would significantly reduce the scenic values even though the Plains are already modified by the VLA. The Proposed Action would also diminish the scenic quality, naturalness, and solitude of the Mesita Blanca and Eagle Peak WSAs, thereby reducing the quality of recreation experiences. These impacts would be considered significant, as stated in the significance criteria. Impacts to the Cooke's Range WSA are expected to be insignificant. Temporary increases in ORV use would also be considered as generally insignificant.

The BLM and the Southwest Regional Office of the National Park Service formally consulted on potential adverse effects to the CDNST and determined that *construction (as well as operation) of the transmission line would not constitute a major significant impact* (Appendix 6). When the CDNST alignment is established, the transmission line would have little effect on scenic values because the transmission line would cross the trail at previously disturbed areas and at right angles, which would reduce the line's visibility.

Soils and Vegetation

SIGNIFICANCE CRITERIA

Impacts to soils and vegetation were considered significant if:

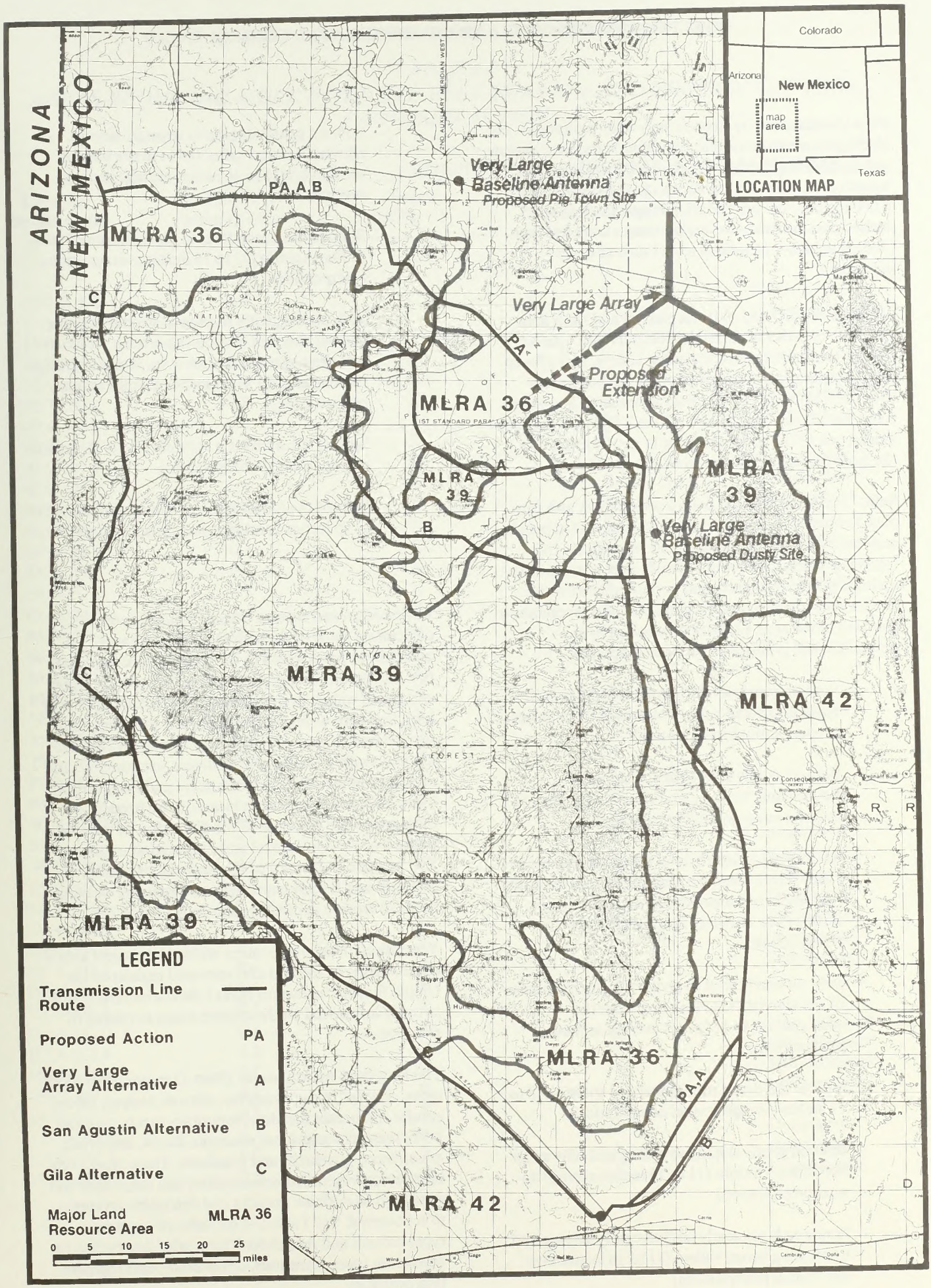
- the loss of soil and reduction of soil productivity and stability prevented successful restoration and recovery to near-preconstruction conditions within 5 years
- following construction, more than 5 years were required to re-establish a ground cover to near-preconstruction densities;
- poisonous or invader plants became established and occupied more than 10 percent of the total vegetation type where none existed previously; or
- the diversity of preconstruction vegetation types could not be restored due to topography or microclimatic changes caused by project construction or operation.

AFFECTED ENVIRONMENT

Setting. Under the Proposed Action, the transmission line would cross three Major Land Resource Areas (MLRAs) as described by the Soil Conservation Service (1981a): 124 miles of MLRA 36, New Mexico and Arizona plateau and mesas; 8 miles of MLRA 39. Arizona and New Mexico mountains; and 71 miles of MLRA 42, Southern Desertic basins, plains, and mountains. See Map 2-1 for location of MLRAs within the project area.

The Southern Desertic basins, plains, and mountains area (MLRA 42) is characterized by nearly level to gently sloping broad basins and valleys bordered by sloping to strongly sloping alluvial fans and terraces. Steep sloping, north-south trending mountain ranges and small mesas commonly occur within the broad basins. Where the transmission line would cross, elevations range from 4,300 to 5,400 feet; average annual precipitation ranges from 8 to 11 inches; and the frost-free period ranges from 180 to 240 days.

The Arizona and New Mexico mountain area (MLRA



Map 2-1 Major Land Resource Areas (MLRA)

39) is characterized by steep to very steep mountains, including associated foothills, mountain meadows, narrow valleys, and floodplains. Where the transmission line would cross, Map 2–1 elevations range from 4,800 to 8,600 feet; annual precipitation ranges from 16 to 25 inches; and the frost-free period ranges from less than 70 days at higher elevations to 115 days at lower elevations.

The New Mexico and Arizona plateau and mesa area (MLRA 36) is characterized by foothills with plateaus and mesas, including broad basins, valleys, and alluvial fans. Intermittent drainageways (dry washes and arroyos) are common. Where the transmission line would cross, elevations range from 5,000 to 7,700 feet; average annual precipitation ranges from 11 to 16 inches; and the frost-free period ranges from 120 to 180 days.

Soils. The project would cross a wide variety and complex combination of soils caused by variations in parent material, topography, climate, and vegetation. The following generalized groups of soils were combined to evaluate potential impacts and to determine effective erosion control measures, reclamation, and revegetation potential in the area. (A brief description of each generalized soil group is provided in Appendix 7.)

- Soils on nearly level to gently sloping broad basin floors and valley bottoms (8 to 11 inches average annual precipitation).
- Soils on nearly level to gently sloping floodplains, terraces, and alluvial fans (8 to 11 inches average annual precipitation).
- Sandy soils on nearly level to undulating broad valley floors commonly including coppice dunes forming in and around mesquite and other shrubs (8 to 11 inches average annual precipitation).
- Soils on nearly level to gently sloping remnants of old alluvial fans extending from the mountains (8 to 11 inches average annual precipitation).
- Soils of the desert mountains and foothills (8 to 11 inches average annual precipitation).
- Soils on gently sloping to rolling and hilly areas bordering foothills (11 to 16 inches average annual precipitation).
- Sandy soils on nearly level to gently sloping and undulating broad valleys (11 to 16 inches average annual precipitation).
- Soils on gently sloping to strongly sloping alluvial fans and valley floors at the base of mountains (11 to 16 inches average annual precipitation).
- Soils on the nearly level to gently sloping Plains of San Agustin (11 to 16 inches average annual precipitation).
- Soils on the gently sloping to strongly sloping alluvial fans and terraces dissected by intermittent drainageways and arroyos, including rough broken land (11 to 16 inches average annual precipitation).
- Soils of the mountain foothills (11 to 18 inches average annual precipitation).
- Soils of the mountains and mountain valleys (16 to 25 inches average annual precipitation).

Reclamation and erosion control would be somewhat difficult on some of the soils in the project area, especially in areas with 8 to 11 inches annual precipitation and on the steeper sloping areas (15 percent slope and more) with soils shallow over bedrock (20 inches or less). Soil with unfavorable properties, including thin surface layers, moderate to strong salinity and alkalinity, and shallow depths over bedrock, are common and present problems for erosion control and revegetation. More intensive reclamation measures are needed for these areas. See Appendix 7 for discussion of the effectiveness of erosion control and reclamation measures. The location and extent of the larger areas of unfavorable soils and terrain requiring more intensive reclamation and erosion control are shown on Table 2–3.

Vegetation. Native vegetation within the project area is characteristic of the arid and semi-arid regions of the United States. Vegetation types follow a pattern that is strongly influenced by the climate zones as related to elevation.

The Proposed Action would affect 12 major vegetation types: riparian, pseudoriparian, pinyon-juniper, mixed conifer, mountain meadow, mountain shrub, creosote bush, mesquite-grassland, mesquite-dunal, sagebrush-grass, yucca-grassland, and grassland. These types combine several vegetation communities and range sites and were used to evaluate impacts and determine revegetation potential. See Table 2–4 for miles of vegetation types crossed and Appendix 7 for a brief description of vegetation types, their uses, importance, and regeneration potential.

TABLE 2-3
AREAS REQUIRING MORE INTENSIVE RECLAMATION AND EROSION CONTROL: PROPOSED ACTION

Location By Milepost	Extent Miles (Acres)	SENSITIVE AREA DESCRIPTION AND COMMENTS		
		Slopes (15% +)	Unfavorable Soils Properties*	Other
0.0– 4.0	4.0		X	Sandy Soils, (Coppice Dunes)
11.0– 11.3	0.3	X	X	
13.0– 13.3	0.3	X	X	
37.4– 38.4	1.0	X	X	
38.7– 39.0	0.3	X	X	Drainageway
40.4– 40.8	0.4	X	X	Drainageway
42.3– 43.6	1.3	X	X	
45.9– 47.1	1.2	X	X	Drainageway
47.8– 48.2	0.4	X	X	Drainageway
48.5– 48.6	0.1	X	X	Drainageway
49.0– 49.1	0.1	X	X	
54.9– 55.2	0.3	X	X	Escarpment
55.7– 55.9	0.2	X	X	
56.8– 57.1	0.3	X	X	Drainageway
63.1– 64.5	1.4	X	X	
65.2– 66.1	0.9	X	X	
66.7– 67.0	0.3	X	X	Drainageway
68.3– 68.5	0.2	X	X	
69.8– 70.3	0.5	X	X	
72.9– 75.3	2.4	X	X	
75.5– 75.9	0.4	X	X	
79.4– 80.0	0.6	X	X	
82.0– 82.7	0.7	X	X	
94.2– 95.4	1.2	X	X	
96.0– 97.0	1.0	X	X	
97.3– 97.4	0.1	X	X	Escarpment
98.3– 99.0	0.7	X	X	Drainageway
99.4–100.0	0.6	X	X	Drainageway
100.4–100.9	0.5	X	X	Drainageway
101.4–102.3	0.9	X	X	Drainageway
103.0–104.1	1.1	X	X	Drainageway
106.4–107.0	0.6	X	X	Drainageway
112.0–112.1	0.1	X	X	
112.3–112.8	0.5	X	X	
151.8–152.0	0.2	X	X	Mtn. Sideslope
153.4–153.6	0.2	X	X	Mtn. Sideslope
154.3–154.5	0.2	X	X	Mtn. Sideslope
169.5–169.7	0.2	X	X	Drainageway
169.9–171.2	0.3	X	X	
173.4–173.6	0.2	X	X	Drainageway
174.0–174.7	0.7	X	X	Drainageway
178.0–178.9	0.9	X	X	Drainageway

TABLE 2-3 (Concluded)
AREAS REQUIRING MORE INTENSIVE RECLAMATION AND EROSION CONTROL: PROPOSED ACTION

Location By Milepost	Extent Miles (Acres)	SENSITIVE AREA DESCRIPTION AND COMMENTS: Slopes (15% +)	Unfavorable Soils Properties*	Other
179.9–180.1	0.2	X	X	Escarpment
199.9–201.0	1.1	X	X	Volcanic
TOTAL:	29.1 (87)			

NOTE: Table prepared from soils-terrain analysis and orthophotograph interpretations. Milepost locations are approximate, based on general, preliminary right-of-way information.

*Unfavorable soil property parameters:
- shallow over bedrock
- underlain by hard bedrock
- sandy loam sand and clay textured surface and subsoil layers
- containing more than 35 percent coarse fragments by volume, exceeding sizes of 3 inches in diameter
- permeability less than 0.6 inch per hour
- water table less than 72 inches below surface
- soil reaction with pH value greater than 8.5, salinity more than 16 millimhos in the upper 40 inches

These soils will require more intensive reclamation and erosion control.

TABLE 2-4
VEGETATION TYPES AFFECTED AND DISTURBED BY THE PROPOSED ACTION

Vegetation Type	Miles Crossed	Acres Disturbed
Riparian	1.2	4
Pseudoriparian	2.3	7
Pinyon-Juniper	20.2	61
Mixed Conifer	0.6	2
Mountain Meadow	2.6	8
Mountain Shrub[1]	25.9	77
Creosote Bush	17.6	52
Mesquite-Grassland	11.4	34
Mesquite-Dunal	4.8	14
Sagebrush-Grassland	6.4	19
Yucca-Grassland	0.8	3
Grassland[2]	109.2	328
TOTAL:	228.0	717

Refer to Appendix 7 for source of data and description of vegetation types. All disturbed land will be reclaimed.

[1] A total of 71 acres of mountain shrub occur in MLRA 36 and 6 acres in MLRA 42.

[2] A total of 226 acres of grassland occur in MLRA 36 and 102 acres in MLRA 42.

Canada wildrye

IMPACTS

Construction and installation activities would create land disturbances associated with (1) access trail and road upgrading, (2) additional road construction, (3) tower pad site clearing and grading where needed, (4) right-of-way clearing for safe operation of conductors where needed, and (5) storage and staging areas. Blading of understory vegetation would be avoided where feasible. Construction and installation of the transmission line would disturb 609 acres of land, all of which would be reclaimed.

Land disturbances would result in (1) vegetation removal (large shrubs, trees, and some understory vegetation where grading is needed during road construction), (2) soil compaction, (3) alteration of the soil profiles in areas of road construction and where tower pads would be graded, (4) trimming of trees within rights-of-way for safe operation of conductors, and (5) crushing of vegetation by vehicles and during tower construction, conductor stringing, and tensioning.

Accelerated wind and water erosion would occur where land has been disturbed and continue until erosion control measures were implemented (within 1 year). Also, access roads required for project construction and maintenance could be used for ORV activities, thus creating problems in controlling and minimizing off-road land disturbance. Vehicles could cause ruts in unsurfaced access roads during wet weather; the ruts could concentrate runoff causing gully erosion.

The erosion control and revegetation program outlined by El Paso and the company's concurrence to comply with the erosion control, reclamation, and revegetation guidelines outlined in Appendix 2 would provide an effective program that would ensure successful erosion control and restoration of all land disturbance.

Soils. The transmission line would cross 29.1 miles of soil and terrain most susceptible to impacts. These sensitive areas contain less favorable soil, slope, and climatic conditions; are more susceptible to erosion hazards; and have a lower revegetation potential. See Table 2-3 for the location and extent of these sensitive areas.

With effective use of the applicable erosion control and reclamation measures outlined in Appendix 2, the loss of soil and reduction of soil productivity and stability would be insignificant and allow for successful restoration to near-preconstruction conditions.

Some unquantifiable soil loss resulting from accelerated wind and water erosion would occur until erosion control measures were implemented (1 year). A few, small unquantifiable areas (mainly abrupt steep slopes and localized areas with soil containing unfavorable physical and chemical properties) would be subject to accelerated erosion and require intensive and continuing follow-up erosion control measures. However, soil impacts could be significant if applicable erosion control measures were not properly implemented due to lack of compliance with approved plans and stipulations, or if adverse weather conditions (mainly heavy rainstorms) occurred during construction before erosion control methods could be implemented.

Vegetation. The estimated acreage of each major vegetation type that would be disturbed by construction

and installation of the transmission line and occupied by associated facilities (maintenance roads) are shown on Table 2–4.

With effective use of the applicable erosion control, reclamation, and revegetation program outlined in Appendix 2 and the kind of land disturbance associated with transmission line construction, impacts to vegetation would be generally insignificant. Understory vegetation (grasses and forbs) is expected to return to near-preconstruction conditions within 5 years after construction. Overstory vegetation (trees and shrubs) would take longer to become established to near-preconstruction conditions (Appendix 7, Vegetation section). However, overstory vegetation would be permanently removed and replaced with understory vegetation or growth-controlled to allow access and provide safe transmission line operation. Generally, only small areas (at tower sites and beneath the lines) of overstory vegetation would be disturbed, of which most would be crushed or trimmed. Larger areas of disturbance may be required in steeper terrain.

Alfalfa

Livestock Grazing

SIGNIFICANCE CRITERIA

Impacts to livestock grazing were considered significant if:

- the amount of forage lost to grazing within an allotment exceeded 1 percent;
- the amount of forage lost reduced livestock stocking rates by 1 percent or more in affected pastures or allotments; or
- transmission line and access road construction or other obstructions without crossings (1) blocked livestock from water for more than 1 day, (2) disrupted grazing patterns for longer than 2 weeks, or (3) the transmission line was located within 250 feet of livestock watering facilities and supplement feeding areas or within 250 feet of ranch headquarters.

AFFECTED ENVIRONMENT

The Proposed Action would cross state and public lands authorized for grazing and private grazing land. Ranch headquarters and major water developments most commonly occur on private or state land, while supplemental water developments are located on public land. Ranching operations include mainly cow-calf or cow-calf-yearling operations. Table 2–5 shows the number of ranch headquarters, dwellings, and livestock watering facilities within 250 feet of the proposed transmission line.

Grazing capacities vary in the area due to vegetation types; range sites; and landform, slope, and range condition. Grazing capacities range from 4 to 30 acres per animal unit month (AUM). The low carrying capacities occur mainly in the Southern Desertic basin, plains, and mountains area (MLRA 42) with 8 to 11 inches annual precipitation (Map 2–1). This area supports mesquite and creosote bush vegetation with an average of 20 to 30 acres per AUM. Middle elevation areas (MLRA 36) with 11 to 16 inches of annual precipitation support Table 2–5 grasslands with an average 8 to 12 acres per AUM. Higher elevations and areas with 16 to 20 inches of annual precipitation support more forage production, resulting in higher carrying capacities averaging 4 to 6 acres per AUM.

TABLE 2-5
DISTANCE OF THE PROPOSED ACTION FROM RANCH HEADQUARTERS, DWELLINGS, AND LIVESTOCK WATERING FACILITIES[1]

Location by Milepost	Distance to Ranch Headquarters and Dwellings (Ft)[2]	Distance to Livestock Watering Facilities (Ft)[3]	Additional Notes
0.3	250–500		
0.4	0–250*		
1.6		0–250*	
27.9		250–500	Windmill
30.9		250–500	Windmill
33.7	500–1,000		Ranch Hq
48.8		0–250*	Windmill
71.3		500–1000	Well
71.6		500–1,000	Tank
74.4		0–250*	Well
75.2		0–250*	Well
81.8		0–250*	Well
83.0		0–250*	Water Tower
86.6		0–250*	Water Tower
95.5		500–1,000	Windmill
117.0		0–250*	Well
127.3		250–500	Tank (Pond)
136.3	0–250*		Dwelling
139.0		250–500	Windmill
140.0	0–250*		Dwelling and Windmills
140.9		250–500	
142.9		250–500	
143.4	0–250*		Dwelling
145.7		500–1,000	Windmill
146.4		250–500	Pond (Intermittent)
151.8		500–1,000	Spring
154.9	500–1,000		Dwelling
155.1		0–250*	Fund (Intermittent)
157.3	500–1,000		Dwelling
170.0		250–500	Windmill
176.3		250–500	Windmill

SOURCE: Locations of ranch headquarters, dwellings, and watering facilities recorded from the latest U.S. Geological Survey topographic maps, scale 1:24,000, supplemented with BLM and local land status maps.

*Facilities occurring within the 250-foot distance of concern.

[1] Includes ranch headquarters, dwellings, and livestock watering facilities within 1,000 feet of the transmission line.

[2] Includes livestock watering facilities when associated with the ranch headquarters and dwellings.

[3] Includes livestock watering facilities (tank, pond, and windmill) not associated with ranch headquarters.

IMPACTS

The land disturbance associated with construction and installation of the transmission line would cause a short-term (1- to 5-year) loss of forage on 609 acres scattered along the 203-mile-long route. The disturbance would occur mainly along access roads and in the small plots surrounding tower sites. Blading of understory vegetation over much of the route would reduce forage loss. Clearing would be required in rougher terrain and in some of the creosote bush and mesquite-dominated vegetation types. Mesquite and creosote bush vegetation types normally represent poorer range lands that support mostly sparse grasses and low value shrubs and have low livestock carrying capacities. Vehicular traffic and project construction would cause forage loss through crushing. Experience with this type of disturbance indicates that a large portion of the forage lost from vehicular traffic would recover within 2 to 3 years.

Assuming maximum disturbance, transmission line construction would disturb an average of 3 acres per mile for 1 to 5 years. This disturbance represents about 1/8 AUM per mile on lands with lower forage production, 1/3 AUM per mile in the middle elevation areas with more favorable precipitation, and 1/2 AUM per mile on lands with higher forage production.

Loss of forage along the Proposed Action route would amount to an estimated 54 AUMs per year, spread along 203 miles. The invasion of poisonous and invader plants is expected to be well below 10 percent due to the small amount of land grading and would not significantly affect livestock grazing.

In addition to direct loss of livestock forage and the invasion of unfavorable plants, other secondary potential impacts could occur during the grazing season, depending on construction procedures: (1) transmission line construction disrupting daily livestock access to watering facilities for more than 1 day; (2) construction disrupting grazing patterns for more than 14 days; and (3) gates left open or temporary gap fences not secured, resulting in livestock control problems. However, with proper construction procedures (timing and compliance) these impacts are not expected to occur.

Electromagnetic effects on livestock from transmission line operation would be insignificant. (See the Electromagnetic Effects section for discussion.)

Even though the induced shock effect is mitigated, a transmission line operating directly over or within 250 feet of ranch facilities could pose potential hazards to the maintenance of wells and windmills; storage of livestock feed; and use of ranching equipment such as loaders, booms, and large trucks. These hazards could occur from contact with towers and conductors, causing injury, possible electrocution, and equipment damage.

Socioeconomics

IMPACT SIGNIFICANCE CRITERIA

Socioeconomic impacts were considered significant if changes in the following were 10 percent or more over the baseline:

- total employment or per capita personal income of a county;
- production of an industry sector in a county; or
- total revenue of a county or school district.

AFFECTED ENVIRONMENT

The area of influence for population, employment, and per capita personal income analyses includes:

- Springerville-Eagar, Apache County, Arizona;
- Datil and Quemado-Omega, Catron County, New Mexico;
- Deming, Luna County, New Mexico;
- Truth or Consequences-Williamsburg, Sierra County, New Mexico; and
- Magdalena and Socorro, Socorro County, New Mexico.

Refer to Appendix 8 for description of the gravity model used to determine the area of influence.

The area of influence for revenue analyses includes the following counties and school districts in New Mexico:

Catron County,
Quemado School District,
Luna County,
Deming School District,
Sierra County,
Truth or Consequences School District,
Socorro County, and
Magdalena School District.

Employment and income in most of the area of influence have declined since 1980 because of depressed conditions in the copper and timber industries. Growth in retired population, tourism, and grapes and wine production have not been enough to offset the decline. Population has not declined as much as employment, and unemployment remains high. Although the copper and timber industries are expected to recover, employment growth in the area is expected to remain slow; an average growth rate of 1.5 percent per year is projected through 1990 for the five New Mexico counties (Temple and Wombold 1983).

The Springerville-Eagar area in Apache County, Arizona is an exception to the depressed condition of the rest of the area of influence. Construction of several power plants has added new employment and increased the population (Golightly 1984).

IMPACTS

Construction. Construction of the Proposed Action would not cause any significant impacts. Refer to Tables 2–6 and 2–7 for data relating to population, employment, per capita personal income, and local government revenue. As a result of construction between 1986 and 1987, population growth is expected to range from 4 percent in Datil and 3 percent in Quemado-Omega to less than 1 percent in the other communities. Total employment growth would vary from 2 percent in Luna and Sierra counties to less than 1 percent in Apache County. Per capita personal income and property tax revenue would increase by less than 1 percent in all counties. All of these impacts fall below the 10 percent significance criteria. As a result, the effects on housing, public services and facilities, and social conditions in the area of influence would also be insignificant.

The livestock grazing industry would incur insignificant losses as a result of transmission line construction. (See Livestock Grazing section for more discussion.) No other local industry sectors would be affected by construction.

Operation. Since transmission line operation would require no more than five workers, the operation would not cause any significant, long-term impacts to population, employment, or per capita personal income. Impacts to local government revenue (Table 2–7) would also be insignificant, ranging from 1 percent in Catron and Sierra counties to less than 1 percent in the other jurisdictions. In both cases, increases in revenues would be far below the 10 percent significance criteria. Losses to livestock grazing and timber industries would be insignificant.

Transportation Networks

IMPACT SIGNIFICANCE CRITERIA

Impacts to transportation networks were considered significant if:

- the increase in project-related traffic reduced the level-of-service below level *C* as defined in the *Highway Capacity Manual* (American Association of State Highway and Transportation Officials 1965);
- the added traffic over baseline accelerated road deterioration, thereby increasing the maintenance costs of area roadways beyond those scheduled by the responsible agency; or
- the projected increase in traffic increased vehicle accidents on project roadways.

AFFECTED ENVIRONMENT

The area of influence for the Proposed Action includes U.S. Highway 60 and State Highways 78, 12, 52, 90, 27, and 26 in Catron, Socorro, Sierra, and Luna counties, New Mexico, and Apache County, Arizona. These roads are primarily used for local traffic but have some long-distance, through traffic.

The transportation analysis for the Proposed Action includes primary and secondary paved and graveled roadways, plus primitive dirt roads. Major federal and state roads would be used to carry material, equipment, and the workforce to construction sites. In addition, various county and private gravel and dirt roads would provide direct access from the major roads to the transmission line right-of-way. (See Map 2–2 for location of major roadway segments that would be affected during project construction.)

The construction spreads, storage yards, types of construction material, and workforce are discussed in Chapter 1. Table 2–8 identifies baseline traffic data for the major highways that would be affected by construction of the Proposed Action.

IMPACTS

Construction of the Proposed Action would increase traffic volume on roadway segments of U.S. Highway 60 and State Highways 78, 12, 52, 90, 27, and 26. Project-related traffic could add as many as 104 vehicle trips per day to the roadway segments. U.S. Highway 60 and State Highways 26 and 90 could sustain the increased auto and truck traffic without lowering the

TABLE 2-6
IMPACTS TO POPULATION, EMPLOYMENT, AND PER CAPITA INCOME FROM CONSTRUCTION OF THE PROPOSED ACTION

County and Community	Baseline	Increase over Baseline	Percentage Increase over Baseline
Population			
Apache County	62,500	50	N/A*
Springerville-Eagar	5,920	50	0.8
Catron County	2,900	20	N/A*
Datil	220	10	4.5
Quemado-Omega	350	10	2.9
Luna County	16,700	80	N/A*
Deming	10,830	80	0.7
Sierra County	9,100	50	N/A*
Truth or Consequences - Williamsburg	6,170	50	0.8
Socorro County	14,500	50	N/A*
Magdalena	1,210	10	0.8
Socorro	8,960	40	0.4
Total Employment			
Apache County	18,000	50	0.3
Catron County	900	10	1.1
Luna County	4,900	90	1.8
Sierra County	2,800	50	1.8
Socorro County	5,000	50	1.0
Per Capita Personal Income			
Apache County	$ 5,948	$ 5,960	0.2
Catron County	6,230	6,286	0.9
Luna County	7,835	7,899	0.8
Sierra County	9,274	9,326	0.6
Socorro County	6,321	6,373	0.8

See Appendix 8 for data sources and analysis methods.

*N/A = not applicable; the significance of population increase is measured for communities because they have to provide the facilities and services.

TABLE 2-7
IMPACTS TO LOCAL GOVERNMENT REVENUE
FROM CONSTRUCTION AND OPERATION OF THE PROPOSED ACTION

County and School District	Baseline Revenue*	Revenue Increases over Baseline*	Percentage Increase over Baseline
Construction (1986–1987)			
Catron County	$1,398	$ 2	0.1
Quemado School District	1,116	1	0.1
Luna County	2,927	1	**
Deming School District	9,022	1	**
Sierra County	1,246	1	0.1
Truth or Consequences School District	3,550	**	**
Socorro County	1,964	0	0.0
Magdalena School District	1,652	0	0.0
Operation (1990)			
Catron County	$1,527	$18	1.2
Quemado School District	1,253	4	0.3
Luna County	3,013	18	0.6
Deming School District	9,285	10	0.1
Sierra County	1,259	12	1.0
Truth or Consequences School District	3,585	5	0.1
Socorro County	1,977	5	0.3
Magdalena School District	1,669	5	0.3

See Appendix 8 for data sources and analysis methods.

*Figures are given in thousands of dollars.

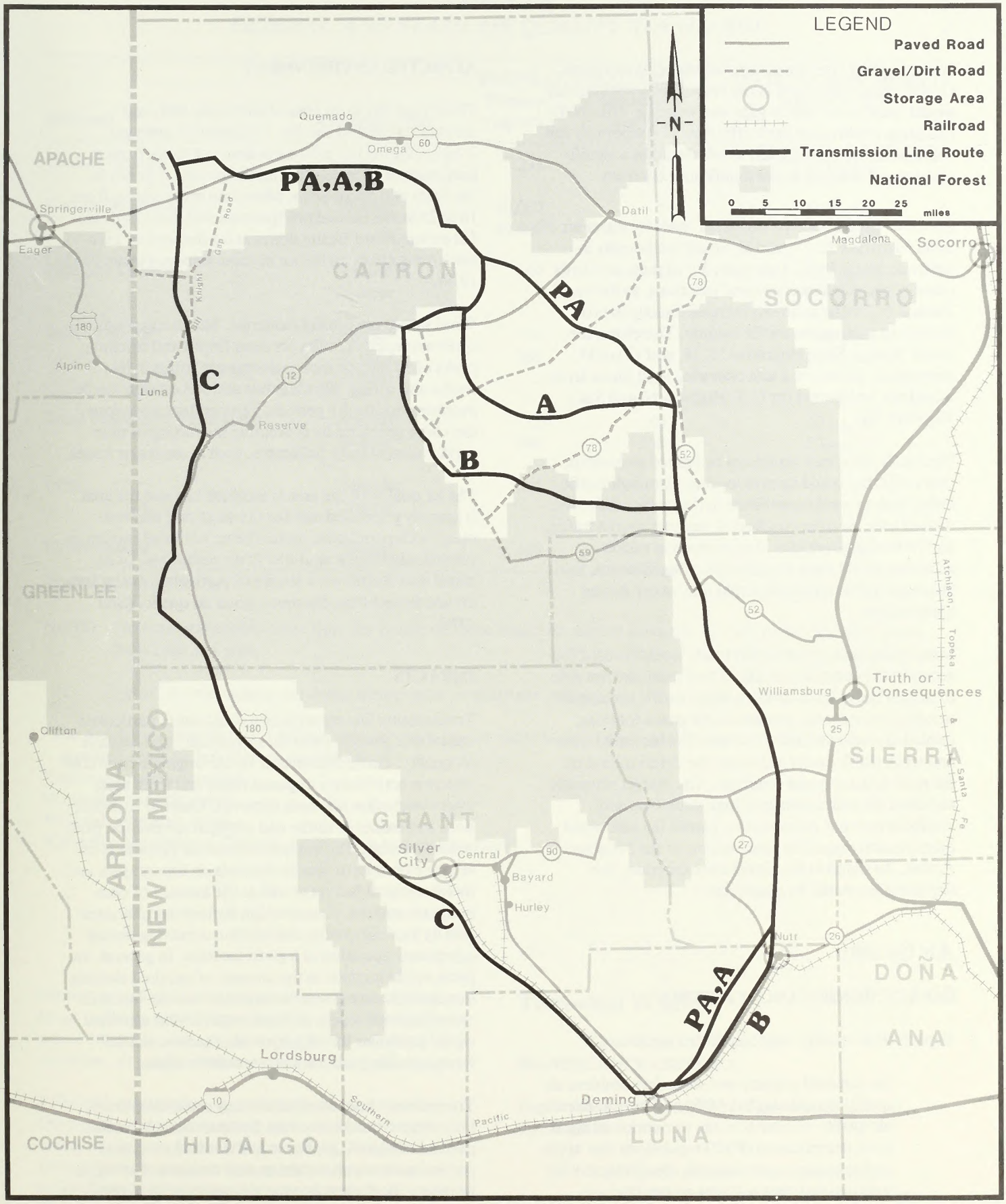
**Less than $500 or 0.05 percent.

TABLE 2-8
TRAFFIC ACCIDENT DATA: BASELINE 1986 AND PROJECTED INCREASES FROM THE PROPOSED ACTION

Roadway Segments	Total Miles of Roadway Segments	AVERAGE DAILY TRAFFIC		TOTAL ACCIDENTS		Projected Increased Accidents	Percent of Accidents at Junctions 1986	Projected Accidents at Junctions
		1986	Projected	1986	Projected			
State Highway 26 between Junction of U.S. 180 and Junction of Interstate 25	47	1,426	1,530	19	20.3	1.3	6	0.0
State Highways 52 and 78 between Junction Interstate 25 and Junction of State Highway 78 to U.S. 60	91	135	239	13	18.7	5.7	50	2.9
State Highway 12, between Junction of U.S. 60 and Horse Springs	21	221	325	5	6.6	1.6	0	0.0
U.S. Highway 60 between Arizona state line and Socorro	139	835	939	34	37.8	3.8	27	1.0
TOTAL:	298	N/A	N/A	71	83.4	12.4	N/A	3.9

SOURCE: New Mexico State Highway Commission 1983.

NOTE: Projected baseline calculated on the basis of a 1.5 percent annual population increase; N/A = Not Applicable.



Map 2-2 Transportation Networks Affected By The Proposed Action And Alternative Action Routes

level-of-service; the other highway segments could not. Downstream traffic flow at the end of each working day would cause short vehicle gaps and weaving. This traffic condition could cause the traffic flow to temporarily fall below a safe operating level, which would be a significant impact as stated in the significance criterion.

Increased project-related traffic on roadway segments of State Highways 52, 78, and 12 would temporarily increase accidents by 12.4 per year; 3.9 of these accidents could occur at intersections and junctions, as shown in Table 2–8. Traffic accidents increase directly in proportion to increases in traffic volume. Therefore, the traffic flow on State Highways 52, 78, and 12 could temporarily fall below a safe operating level (these levels would not be lowered for U.S. Highway 60 and State Highway 26).

The traffic accidents would not be limited to construction traffic but could involve local and through traffic. Other factors would contribute to the traffic accidents: time of year, weather conditions, summer tourist traffic, and recreational vehicles. Any increase in traffic accidents would meet the criterion of significance, but increased traffic accidents would only occur during construction.

Many gravel and primitive dirt roads would be used for access to the construction site. These roads are not able to sustain heavy loads or extra heavy traffic because of wooden box culverts, wooden cattle guard footings, unbladed roadbeds, and dirt trails. The increased auto and truck traffic could accelerate the deterioration of the road structures and roadbeds. The budget presently allocated for maintenance of road structures and roadbeds may not be enough to handle the additional deterioration caused by construction of the Proposed Action. As stated in the significance criterion, this deterioration would be significant.

Air Quality

IMPACT SIGNIFICANCE CRITERIA

Impacts to air quality were considered significant if:

- the national primary and secondary ambient air quality standards (NAAQS) and state ambient air quality standards or the prevention of significant deterioration (PSD) regulations that apply to this project were violated. (See Table 2–9 for national and state ambient air quality standards.)

AFFECTED ENVIRONMENT

The project lies in an area of semi-arid, arid, and mountain highland climate. Precipitation averages 7 inches during the growing season but varies from a maximum of 15 inches to a minimum of 3.5 inches in the basin and plains areas. Mountain areas receive from 16 to 25 inches annual precipitation with increased rainfall on windward-facing slopes and a decrease or rain-shadowing effect on the lee of mountainous terrain (SAI 1978).

Wind speeds are usually moderate, but strong winds, often exceeding 30 miles per hour (mph) and reaching peaks of 50 mph or more, accompany fronts in late winter and spring. Blowing dust and soil erosion can be problems during dry periods. Temperature inversions can cause problems by preventing the mixing of near-surface atmospheric pollutants, such as smoke or fumes.

The air quality of the area is excellent because the area is sparsely populated and for the most part undeveloped, with population centers being not large enough to generate significant amounts of air pollutants. Occasional dust storms are a source of particulate matter but do not detract from the area's good air quality (SAI 1978).

IMPACTS

Transmission line construction could cause particulate matter and gases to enter the atmosphere and degrade air quality. Particulate matter would originate from construction activities on unpaved roads and from areas where vegetation has been removed. Gaseous hydrocarbons and oxides of sulfur and nitrogen are emitted from vehicle exhaust. The impacts of these air pollutants on sensitive persons or species depends on topographic and meteorological factors as well as the amount of each pollutant emitted. Construction impacts are characterized by local air quality degradation occurring during equipment operation at a given location. In general, impacts would increase as the amount of required clearing increased because more construction activity would increase emission levels. Because construction activities would be similar for all project alternatives, the differences in air quality impacts would be slight.

Transmission line construction may cause temporary, intermittent violations of the 24-hour total suspended particulates NAAQS, but would not lead to annual particulate levels above the annual standard. No regulations specifically regulate the air quality of such construction activities. Impacts from construction would be

TABLE 2-9
FEDERAL AND STATE AIR QUALITY STANDARDS

Pollutant	Averaging Time	FEDERAL STANDARDS Primary ($\mu g/m^3$)	FEDERAL STANDARDS Secondary ($\mu g/m^3$)	STATE OF NEW MEXICO STANDARDS
Oxidant (ozone)	1-hour[a]	235	b	0.06 ppm
Carbon Monoxide	8-hour	10,000	b	8.70 ppm
	1-hour	40,000		13.10 ppm
Nitrogen Dioxide	Annual[c]	100	b	0.05 ppm
	24-hour			0.10 ppm
Sulfur Dioxide	Annual[c]	80		0.02 ppm
	24-hour	365		0.10 ppm
	3-hour		1,300	
Total Suspended Particulates	Annual[d]	75	60	60 $\mu g/m^3$
	24-hour	260	150	150$\mu g/m^3$
Lead	Calendar Quarter	1.5	b	
Hydrocarbons[e]	3-hour	160	b	0.9 ppm

SOURCE: 40 (CFR) 50

NOTE: National standards, other than for ozone or those based on annual averages, are not to be exceeded more than once per year.

$\mu g/m^3$ = micrograms per cubic meter; ppm = parts per million

[a]The number of days during a calenar year in which one or more hourly values could equal or exceed the ozone standard must be less than or equal to 1.
[b]Same as primary standard.
[c]Annual arithmetic mean.
[d]Annual geometric mean.
[e]Guideline for Oxidant Control; no longer a national standard.

temporary and would not trigger analysis or permitting by air pollution control agencies. The air quality significance criteria for this project would not be exceeded; therefore, air quality impacts would not be significant.

Following construction, operation of the transmission line would produce only minor amounts of ozone and oxides of nitrogen from corona reactions. The pollutants from transmission line operation are not known to significantly increase ambient concentrations (Oregon Department of Energy 1980; BPA 1977; Roig 1979).

Terrestrial Wildlife

SIGNIFICANCE CRITERIA

Impacts to terrestrial wildlife species were considered significant if:

- more than 10 percent of the total available crucial habitats of a species (for example, high priority summer and winter ranges, critical sum-

mer and winter ranges, calving/fawning areas, nesting and brooding areas) were removed;

- any crucial habitats, such as winter ranges, calving/fawning areas, brooding areas, raptor nesting areas, migration routes, and riparian areas were disturbed during the normal season of use;

- more than 1 percent of the total habitat within a 1-mile-wide corridor was disturbed; or

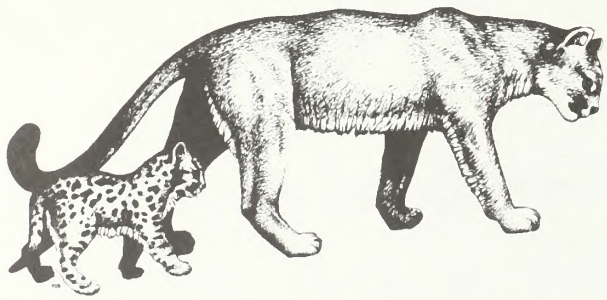
- more than 1 percent of riparian habitat occurring within the area of influence was disturbed by project construction or removed;

AFFECTED ENVIRONMENT

The Proposed Action route would cross 12 habitat (vegetation) types as described in the Soils and Vegetation section. These habitat types are also briefly described in Appendix 7, along with their use and revegetation potential.

Although the riparian habitat type occurs on less than 1 percent of the route, in terms of animal diversity and density it is probably the most important wildlife habitat type that would be crossed by the Proposed Action route. In fact, studies in the Mountain West (Thomas and others 1978) show that the importance of riparian habitat to wildlife is much greater than its frequency in the area would suggest.

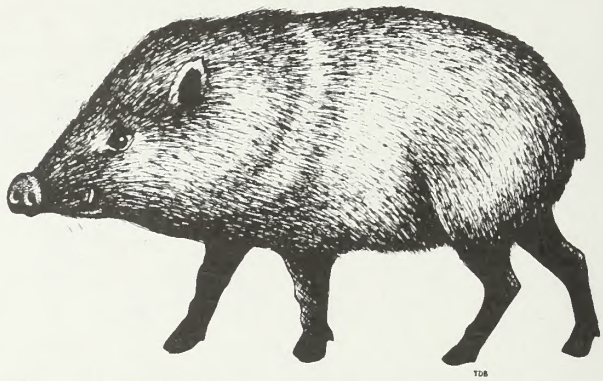
The pseudoriparian habitat type provides year-round range for pronghorn, javelina, small rodents, predators, non-game birds, and quail. It also provides hunting and nesting habitat for several raptor species.



Mountain lion and cub

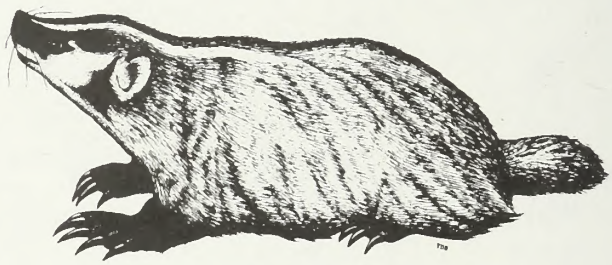
The year-round range for pronghorn, javelina, small mammals, non-game birds, predators, and quail is found in creosote bush habitat. Several raptor species also use the habitat type for hunting and nesting.

The mesquite-grass and mesquite-dunal habitat types support pronghorn, javelina, small mammals, predators, small non-game birds, and quail. Nesting and hunting raptors also use this type.



Collared peccary

The yucca-grassland and grassland type supports pronghorn, small mammals, non-game birds, predators, raptors, and quail.



Badger

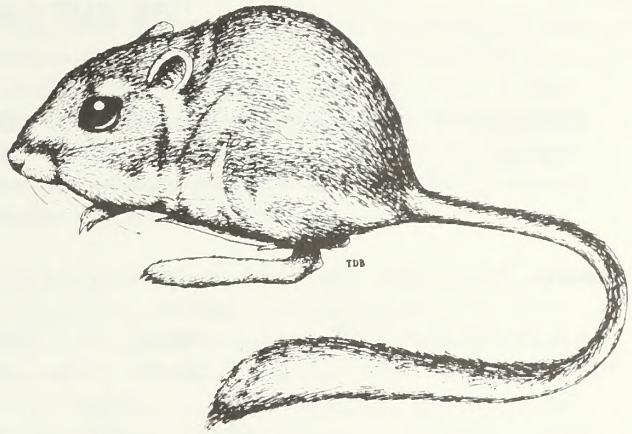
Sagebrush-grass is an interspersed vegetation type that furnishes food and cover on a year-round basis for mule deer, pronghorn, small mammals, predators, raptors, non-game birds, and quail.

Pinyon-juniper is important to many species of birds and furnishes important deer winter range, javelina habitat, and homes for several species of predators that prey on the many species of small mammals which also occupy the type.

The mountain shrub type is used by mule deer and elk, large predators, many small mammal species, birds, and raptors. In the lower elevations, mountain shrubs also furnish winter cover and food.

The mixed conifer habitat type furnishes cover for elk and deer, large predators, and some small mammals.

Other species such as small birds and raptors use this vegetation type for food, cover, and nesting. Mixed conifer, used as thermal cover, provides warmth, particularly for big game animals such as deer and elk, which must maintain a nearly constant body temperature. (Black and others 1976).



Ord kangaroo rat

The construction, operation, maintenance, and abandonment of the Proposed Action could affect about 96 species of mammals and an estimated 266 species of birds (Robbins and others 1966; New Mexico Department of Game and Fish 1967; Burt and Grossenheider 1976). The Proposed Action route would cross about 124 miles of mule deer habitat, 49 miles of pronghorn range, 59 miles of black bear habitat, 99 miles of javelina range, 37 miles of turkey habitat, and 80 miles of quail habitat. (See Table 2–10 for wildlife species that would be affected.)

TABLE 2–10
WILDLIFE SPECIES AND HABITATS AFFECTED BY THE PROPOSED ACTION

Wildlife Species	Miles of Occupied Habitat	Crucial Habitats	Habitat Trends[1]	Population Estimate	Population Trend	Acres of Temporarily Removed[2]
Mule Deer						
MP 10–12	2	None	stable (4)	1.00 deer/Sec.	increasing	6
MP 67–95	28	None	stable (5)	3.00 deer/Sec.	decreasing	84
MP 95–117	22	None	stable (4)	0.75 deer/Sec.	decreasing	66
MP 117–123	6	None	stable (3)	0.30 deer/Sec.	decreasing	18
MP 137–203	66	Winter Range MP191A–188A	stable (5)	0.70 deer/Sec.	decreasing	198
TOTAL:	124					372
Pronghorn						
MP 14–21	7	None	stable (5)	75	stable	21
MP 96–138	42	None	stable (1)	125	decreasing	126
TOTAL:	49					147
Black Bear						
MP 87–117	30	None	stable	100	stable	90
MP 140–160	20	None	stable	20	stable	60
MP 168–177	9	None	stable	50	decreasing	27
TOTAL:	59					177

TABLE 2-10 (Concluded)
WILDLIFE SPECIES AND HABITATS AFFECTED BY THE PROPOSED ACTION

Wildlife Species	Miles of Occupied Habitat	Crucial Habitats	Habitat Trends[1]	Population Estimate	Population Trend	Acres of Temporarily Removed[2]
Javelina						
MP 0-93	93	None	stable	2,500	increasing	279
MP 138-144	6	None	stable	25	stable	18
TOTAL:	99					297
Turkey						
MP 88-109	21	None	stable	2,000	increasing	63
MP 174-190	16	None				48
TOTAL:	37					111
Quail						
MP 0-80	80	None	stable	not calculated	stable	240

SOURCE: Based on the wildlife distribution, population estimates, and habitat classifications on computerized maps furnished by the Technology Application Center, University of New Mexico, using data from the New Mexico Department of Game and Fish (current as of July 1982).

[1]The numbers in parentheses are judgmental ratings from the New Mexico Department of Game and Fish of the quality of the occupied habitat ranging from 1 to 10 (1 = the lowest possible quality; 10 = the highest).

[2]These are areas of habitat that would be temporarily disturbed and then revegetated. Revegetation is expected to be complete in 3 to 5 years.

The only crucial habitat identified by the New Mexico Department of Game and Fish is a small area of mule deer winter range located between MP 168 and 175 (Table 2-10).

Raptor nesting areas occur along most of the Proposed Action route. These areas are usually occupied during the March 1 through July 1 nesting and fledging period.

IMPACTS

Table 2-10 lists the acres of habitat type that would be disturbed by construction of the Proposed Action. Long-term losses of wildlife habitat from placement of permanent facilities are not considered to be significant because they represent less than 1 percent of the habitat in the affected areas.

If El Paso adheres to its construction schedule (Chapter 1), most of the direct impacts to wildlife would be avoided and disturbances from construction to crucial habitats (mule deer winter ranges) during critical times of the year would be reduced.

Some secondary adverse impacts could occur but are expected to be short term and insignificant except for the possibility of some illegal killing of wildlife along project maintenance roads. The roads could be used by

persons involved in illegal shooting of perching or nesting raptors, wanton killing of other species, and illegal hunting of protected game species.

Portions of local wildlife populations could move into adjacent areas causing stress to both dispersed and existing populations. In addition, disturbances within 1 mile of nesting sites could affect successful nesting and production of young birds. Temporary access roads and disturbed sites around power poles would encourage the invasion of grasses and forbs, which would increase cover and food availability for Gambels and scaled quail and other small, non-game birds (Whitford and others 1972).

The towers could provide perching and nesting sites for various types of birds, which would be considered a beneficial, secondary impact. Previous studies in New Mexico reported that golden eagles, cactus wrens, white-necked ravens, and many raptors selected transmission towers for nesting and perching since such high sites are limited in deserts (Whitford and others 1972).

The potential for bird losses from collisions with conductors or overhead ground wires exists but is not expected to be significant because of a lack of bird concentrations along the Proposed Action route. Electrocution of bird species, especially raptors, is not expected to be significant if proper practices are followed during tower construction.

VERY LARGE ARRAY ALTERNATIVE (A)

Electromagnetic Interference

AFFECTED ENVIRONMENT

The affected environment for the Very Large Array Alternative would be similar to that of the Proposed Action. The closest line-of-sight point on the transmission line would be MP 110A, which would be approximately 17 miles away from the future VLA southwest antenna. From that point on, the line would be shielded by the terrain from any line-of-sight between the antenna and the transmission line.

If the VLA antenna sights were extended 13 miles to the southwest as proposed, the closest point on the transmission line would be MP 138A, approximately 11 miles from the end antenna.

IMPACTS

The calculated EMI at the VLA southwest antenna sight would be *− 75 dBW/m² Hz which, when compared to the threshold value (significance criteria) of* − 260 dBW/m²/Hz, would be less and therefore insignificant. The calculated EMI at the future antenna site would be − 268 dBW/m²/Hz which is below the threshold of − 260 dBW/m²/Hz and therefore insignificant.

This alternative would allow an additional extension of the present VLA, if needed—a total of 17 miles beyond the present southwest antenna site. Impacts to the VLBA would be insignificant, the same as discussed for the Proposed Action.

Visual Resources

AFFECTED ENVIRONMENT

The Very Large Array Alternative would cross both physiographic provinces described for the Proposed Action: the Basin and Range and the Colorado Plateaus (Fenneman 1931), changing at about MP 160A. Cultural modifications visible on the landscape along the route are similar to those along the Proposed Action route.

The landscape in three of the five VRM classes would be affected by this alternative. The Very Large Array Alternative would cross 41 miles of VRM Class II areas, generally around and south of the Cooke Range, in the Nutt area, and in the Plains of San Agustin. The route would cross 61.5 miles of VRM Class III areas between Deming and Nutt, in the lowlands north of Winston, south of Omega, and in the Red Hill cinder cone area. Class IV areas account for 112.5 miles of the route and include all of the remaining areas (BLM 1981, 1982, 1983a). Table 2-11 summarizes existing affected areas, by milepost, for each class crossed by the alternative.

IMPACTS

The impacts from this alternative are described in Table 2-12. The Very Large Array Alternative would significantly affect 23 miles of VRM Class II areas, 28 miles of Class III areas, and 3 miles of Class IV areas. The primary significant adverse visual resource impacts would result from placing the transmission line upon the natural-appearing landscape. Generally, the modifica-

tions would not meet the standards of the VRM class for the areas where the project would be located.

Significant impacts are summarized for the following areas of concern: 5.5 miles of the project that would be viewed between Deming and Nutt along U.S. Highway 180 and State Highway 26; 25.5 miles viewed from State Highways 27, 90, 52, and 59 and from local residences and ranches toward the Black Range; 19 miles within the extremely visually sensitive Plains of San Agustin where the transmission line would dominate and degrade the scenic value of the near-natural and unique landscape; and 4 miles along the route that would cross other areas of high scenic quality. The impacts where the route crossed U.S. Highway 60 would most likely be insignificant since accepted design techniques for project alignment across a highway were used.

TABLE 2-11
TOTAL MILES OF VISUAL RESOURCE MANAGEMENT CLASSES AFFECTED BY THE VERY LARGE ARRAY ALTERNATIVE (A)

Milepost	Number of Miles	Class II	Class III	Class IV
0.0- 7.5A	7.5		7.5	
7.5- 9.5A	2.0	2.0		
9.5- 12.0A	2.5			2.5
12.0- 13.5A	1.5	1.5		
13.5- 29.0A	15.5		15.5	
29.0- 33.0A	4.0	4.0		
33.0- 49.0A	15.0			16.0
49.0- 53.0A	4.0		4.0	
53.0- 82.0A	29.0			29.0
82.0- 94.5A	12.5		12.5	
94.5-106.0A	11.5			11.5
106.0-111.0A	5.0		5.0	
111.0-117.5A	6.5			6.5
117.5-124.0A	6.5	6.5		
124.0-130.0A	6.0			6.0
130.0-157.0A	27.0	27.0		
157.0-174.0A	17.0			17.0
174.0-181.0A	7.0		7.0	
181.0-192.5A	11.5			11.5
192.5-193.5A	1.0		1.0	
193.5-196.0A	2.5			2.5
196.0-200.0A	4.0		4.0	
200.0-202.5A	2.5			2.5
202.5-206.5A	4.0		4.0	
206.5-210.5A	4.0			4.0
210.5-211.5A	1.0		1.0	
211.5-215.0A (End)	3.5			3.5
TOTAL:	215.0	41.0	61.5	112.5

Refer to Appendix 5, Visual Management Methodologies, for definitions of terms.

TABLE 2-12
SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS CAUSED BY THE VERY LARGE ARRAY ALTERNATIVE (A)[1]

Milepost	Number of Miles	Existing VRM Class[2]	Primary Viewpoints and Description of Impacts[3]
0.0–3.5A	3.5	III	Viewed from U.S. Highway 180, State Highway 26, rural residences as fg/mg. Would add to cumulative impacts of existing transmission line.
7.5–9.5A	2.0	II	Viewed from State Highway 26, local access to ranches and mines as fg/mg. Addition of new structure in natural-appearing landscape would cause contrast in form and line elements.
25–31A	2 4	II III	Viewed from State Highway 90 as fg/mg. Would add 1.0 IV elements of form and line to natural-appearing landscape.
50.5–54.5A	3 1	III IV	Viewed from State Highway 90 as fg/mg. Would add elements of form and line to natural appearing landscape.
89–84A	2	III	Viewed from State Highway 52 and community of Winston as fg/mg. Contrasts in addition of form and line elements of transmission line, and form, line, color, and textural changes in vegetation removal.
88–96.5A	6.5 2.0	III IV	Viewed from State Highway 52 and 59 as fg/mg. Contrasts in elements of form and line in a natural-appearing landscape.
106–111A	5	III	Viewed from State Highway 52 and local ranches as fg/mg. Contrasts in form and line with near-natural landscape.
138–157A	19	II	Viewed from State Highway 12, local roads, ranch headquarters, and the Continental Divide and Horse Mountain WSAs as fg/mg. Contrasts in elements of form and line of the transmission line towers and conductors with the natural appearing landscape would attract attention and create a dominant feature in terms of scale in the Plains of San Agustin.
174.5–178.5A	4	III	Viewed from county road along Mangus Creek as fg/mg. Contrasts in elements of form and line would dominate the existing landscape in terms of scale.

[1] All visual resource impacts would be caused by adding transmission towers and conductors to the landscape, unless otherwise noted.

[2] Refer to Appendix 5, Visual Resource Management Methodologies, for definitions of terms.

[3] All impacts would last for the life of the project—until the transmission line is removed.

Distance Zones: fg = foreground; mg = middleground; bg = background;
fg/mg = foreground/middleground.

Cultural Resources

AFFECTED ENVIRONMENT

Cultural resources along the Very Large Array Alternative route are similar to those along the Proposed Action route. The Very Large Array Alternative route has been crossed 15 times by cultural resource inventories related to seismic tests or right-of-way inventories. Over 40 known cultural sites have been identified within a 1-mile-wide corridor of the alternative route. These sites include lithic scatters or campsites that may relate to Paleo-Indian or Archaic occupations or to any of the more recent Indian occupations. Identified site types include pueblos, lithic scatters, caves, quarrys, and historic homesteads. Four sites are Mogollon. The alternative would cross the Magdalena livestock driveway at MP 161A. Three sites are associated with the Historic period.

The following are either on or determined eligible for listing on the National Register of Historic Places: Mogollon Pueblo (Cox Ranch Pueblo), the Magdalena livestock driveway, Paleo-Indian, Archaic, Mogollon-Mimbres, Anasazi (Chacoan), Animas, and Salado. Areas of high site probability can be found between MP 80A and 106A and between MP 181A and 215A.

IMPACTS

Impacts from the Very Large Array Alternative would be similar to those identified for the Proposed Action.

Wilderness

AFFECTED ENVIRONMENT

The Very Large Array Alternative route would be located 3 miles or less from five BLM-administered WSAs: Mesita Blanca (NM-020-018), Eagle Peak (NM-020-019), Cooke's Range (NM-030-031), Horse Mountain (NM-020-043), and Continental Divide (NM-020-44). All five WSAs were inventoried and found to have wilderness characteristics (BLM 1980).

Horse Mountain WSA (Map 1-2). The Horse Mountain WSA is located on an isolated mountain peak rising abruptly out of the Plains of San Agustin. It is characterized by high vertical cliffs, steep and rocky slopes, deep canyons and heavy forest interspersed with small, pond-like meadows. The WSA appears predominantly natural, with landform and diverse vegetation offering outstanding opportunities for both solitude and primitive recreation. A suitability recommendation for wilderness designation was made for 4,432 acres out of the 5,032-acre WSA (BLM 1984). The alternative route would pass 1 to 2 miles west of the WSA between MP 153A and 156A.

Continental Divide WSA (Map 1-2). This unit, which straddles the Continental Divide, is characterized by high mountain peaks and rugged canyons with vast expanses of mountain prairie and rolling grassland. Vegetation varies from rolling prairie species to Ponderosa pine, aspen, and mixed conifer forest types. Along with its extreme physical characteristics, the natural qualities of the WSA offer outstanding opportunities for both solitude and primitive recreation. A suitability recommendation for wilderness designation was made for 35,635 acres out of the 68,761-acre WSA (BLM 1984). The alternative would pass a half mile north of the WSA between MP 120A and 140A. See the Proposed Action, Wilderness section, for discussion of the Mesita Blanca, Eagle Peak, and Cooke's Range WSAs.

IMPACTS

No significant, direct impacts to the wilderness resource would be caused by the alternative route crossing the unit boundaries since no crossings are proposed. The transmission line is expected to be visible from the Mesita Blanca, Eagle Peak, Horse Mountain, and Continental Divide WSAs. The alternative would not affect the Cooke's Range WSA because of the existing cultural modifications and the distance of the route from the WSA.

Horse Mountain WSA. The significance of the direct, long-term visual effects of placing a permanent transmission line along the WSA's western boundary would depend on the user's perspective and viewpoint. Because the WSA provides several panoramic vistas with relatively few cultural modifications, the permanent transmission line 1 to 2 miles west of the WSA between MP 153A and 156A would likely be visible. The transmission line would dominate the landscape visually in terms of scale and contrast in the landscape elements of form, line, color, and texture.

Continental Divide WSA. The significance of the visual effects of placing a permanent transmission line between MP 120A and 130A, about a half mile north of the WSA, would depend on the user's viewpoint. (Forests between MP 130A and 140A would screen the line from sight.) This stretch lies next to the 35,635 acres recommended as suitable for wilderness designation (BLM 1984). The transmission line would particularly detract hikers along the Continental Divide who would be

expecting a natural view and solitude. From higher elevations within the WSA, hikers would view the transmission line heading north toward the Plains of San Agustin; the transmission line would be out of character and contrast visually with the surrounding natural landscape elements. The alternative line would also cross the major northern access route leading to the WSA through Shaw Canyon.

See the Proposed Action, Wilderness section, for a discussion of the impacts to the Mesita Blanca and Eagle Peak WSAs.

Recreation Resources

AFFECTED ENVIRONMENT

The Very Large Array Alternative would cross the same environment as the Proposed Action and pass near the Horse Mountain and Continental Divide WSAs (Map 1-2). The alternative would parallel unimproved, two-lane County Road B040 west of the Horse Mountain WSA. Recreation is limited because of the area's remoteness but includes deer hunting, sightseeing, nature photography, hiking, and ORV use. The alternative route would also cross the primary northern access route through Shaw Canyon leading to the Continental Divide WSA. Primitive recreation opportunities in this area include deer and antelope hunting, sightseeing, hiking, and camping.

The Very Large Array Alternative would cross the CDNST corridor three times (MP 188A, 168A, and 5A) and parallel it for 5 miles between MP 125A and 130A. The crest of the Continental Divide meanders in and out of the Continental Divide WSA. Future use of trail segments across and next to the WSA would probably be less than 100 hikers per year (BLM 1983b). See the Proposed Action, Recreation section, for more information on the CDNST.

IMPACTS

Impacts to recreation from the alternative would generally be similar to those from the Proposed Action. The Very Large Array Alternative would significantly impair the scenic, semi-primitive values enjoyed by recreation users of the Mesita Blanca, Eagle Peak, Horse Mountain, and Continental Divide WSAs. The alternative would not significantly affect the CDNST. The scenic quality for the sightseer and persons experiencing naturalness would be affected in the Plains of San Agustin and along other unquantifiable locations along the alignment. Temporary increases in ORV use could occur. The alternative would significantly affect the scenic quality of the Red Hill cinder cone area.

Soils and Vegetation

AFFECTED ENVIRONMENT

The Very Large Array Alternative would cross landscape and terrain similar to that of the Proposed Action. It would cross 71 miles of MLRA 42, 126 miles of MLRA 36, and 18 miles of MLRA 39. See Map 2-1 for location of MLRAs within the project area and the Proposed Action discussion for description of MLRAs.

The Very Large Array Alternative route would cross the same major soil groups and vegetation types as the Proposed Action. Table 2-13 shows the location and extent of the larger areas of unfavorable soils and terrain requiring more intensive reclamation and erosion control, and Table 2-14 shows the miles of vegetation that would be crossed. See Appendix 7 for a brief description of generalized soil groups and vegetation types. (Revegetation potential and erosion control needs would be the same for the soils affected by this alternative as for those affected by the Proposed Action.)

IMPACTS

The Very Large Array Alternative would disturb 645 acres, all of which would be reclaimed. Types of land disturbance would be the same as from the Proposed Action.

The transmission line would cross 36.8 miles of sensitive soil and terrain. These areas are sensitive because they contain less favorable soil, slope, and climatic conditions than other areas along the route; are more susceptible to erosion hazards; and have a lower revegetation potential. Soil impact potential would be the same as for the Proposed Action. See Table 2-13 for approximate locations and extent of sensitive soil areas.

The Very Large Array Alternative would not significantly affect soils. The loss of soil and of soil stability would be reduced with effective use of the erosion control and reclamation measures outlined in Appendix 2. Such measures would allow disturbed land to return to near-preconstruction conditions. Some unquantifiable soil loss would result from accelerated wind and water erosion until erosion control measures were implemented.

Impacts to vegetation would generally be insignificant. Understory vegetation would return to near-

TABLE 2-13
AREAS REQUIRING MORE INTENSIVE RECLAMATION AND EROSION CONTROL: VERY LARGE ARRAY ALTERNATIVE (A)

Location By Milepost	SENSITIVE AREA DESCRIPTION AND COMMENTS			
	Extent Miles (Acres)	Slopes (15% +)	Unfavorable Soils Properties*	Other
0.0A-4.0A	4.0		X	Sandy Soils, (Coppice Dunes)
11.0-11.3A	0.3	X	X	
13.0-13.3A	0.3	X	X	
37.4-38.4A	1.0	X	X	
38.7-39.0A	0.3	X	X	Drainageway
40.4-40.8A	0.4	X	X	Drainageway
42.3-43.6A	1.3	X	X	
45.9-47.1A	1.2	X	X	Drainageway
47.8-48.2A	0.4	X	X	Drainageway
48.5-48.6A	0.1	X	X	Drainageway
49.0-49.1A	0.1	X	X	
54.9-55.2A	0.3	X	X	Escarpment
55.7-55.9A	0.2	X	X	
56.8-57.1A	0.3	X	X	Drainageway
63.1-64.5A	1.4	X	X	
65.2-66.1A	0.9	X	X	
66.7-67.0A	0.3	X	X	Drainageway
68.3-68.5A	0.2	X	X	
69.8-70.3A	0.5	X	X	
72.9-75.3A	2.4	X	X	
75.5-75.9A	0.4	X	X	
79.4-80.0A	0.6	X	X	
82.0-82.7A	0.7	X	X	
94.2-95.4A	1.2	X	X	
96.0-97.0A	1.0	X	X	
97.3-97.4A	0.1	X	X	Escarpment
98.3-99.0A	0.7	X	X	Drainageway
99.4-100.0A	0.6	X	X	Drainageway
100.4-100.9A	0.5	X	X	Drainageway
101.4-102.3A	0.9	X	X	Drainageway
103.0-104.1A	1.1	X	X	Drainageway
106.4-107.0A	0.6	X	X	Drainageway
110.0-110.3A	0.3	X	X	
110.8-111.0A	0.2	X	X	
112.2-113.2A	1.0	X	X	Mtn. Sideslope
116.8-117.0A	0.2	X	X	Mtn. Sideslope
121.8-122.8A	1.0	X	X	Mtn. Sideslope
123.6-124.0A	0.4	X	X	Mtn. Sideslope
131.8-133.3A	1.5	X	X	Mtn. Sideslope
133.9-134.1A	0.2	X	X	Drainageway
135.2-136.2A	0.6	X	X	
136.7-137.1A	0.4	X	X	
137.8-130.1A	0.3	X	X	
148.1-148.3A	0.2	X	X	
149.0-149.3A	0.3	X	X	
155.0-155.3A	0.3	X	X	
155.4-156.1A	0.7	X	X	Mtn. Sideslope
158.5-159.1A	0.6	X	X	Mtn. Sideslope

TABLE 2-13 (Concluded)
AREAS REQUIRING MORE INTENSIVE RECLAMATION AND EROSION CONTROL: VERY LARGE ARRAY ALTERNATIVE (A)

Location By Milepost	SENSITIVE AREA DESCRIPTION AND COMMENTS			
	Extent Miles (Acres)	Slopes (15% +)	Unfavorable Soils Properties*	Other
163.8-164.2A	0.4	X	X	Mtn. Sideslope
165.4-165.6A	0.2	X	X	Mtn. Sideslope
166.3-166.5A	0.2	X	X	Mtn. Sideslope
181.5-181.7A	0.2	X	X	Drainageway
181.9-182.1A	0.2	X	X	
185.4-185.6A	0.2	X	X	Drainageway
186.0-186.7A	0.7	X	X	Drainageway
190.0-190.9A	0.9	X	X	Drainageway
191.9-192.0A	0.2	X	X	Escarpment
211.9-213.0A	1.1	X	X	Volcanic
TOTAL:	36.8 (110)			

NOTE: Table prepared from soils-terrain analysis and orthophotograph interpretations. Milepost locations are approximate, based on general, preliminary right-of-way information.

*Unfavorable soil property parameters:
— shallow over bedrock
— underlain by hard bedrock
— sandy loam sand and clay textured surface and subsoil layers
— containing more than 35 percent coarse fragments by volume, exceeding sizes of 3 inches in diameter
— permeability less than 0.6 inch per hour
— water table less than 72 inches below surface
— soil reaction with pH value greater than 8.5, salinity more than 16 millimhos in the upper 40 inches

These soils will require more intensive reclamation and erosion control.

TABLE 2-14
VEGETATION TYPES AFFECTED AND DISTURBED BY THE VERY LARGE ARRAY ALTERNATIVE (A)

Vegetation Type	Miles Crossed	Acres Disturbed
Riparian	0.4	1
Pseudoriparian	2.2	7
Pinyon-Juniper	20.7	62
Mixed Conifer	0.6	2
Mountain Meadow	2.6	8
Mountain Shrub[1]	30.1	90
Creosote Bush	17.6	53
Mesquite-Grassland	8.2	25
Mesquite-Dunal	4.8	14
Sagebrush-Grassland	1.5	5
Yucca-Grassland	0.8	2
Grassland[2]	125.5	376
TOTAL:	215.0	645

Refer to Appendix 7 for source of data and description of vegetation types. All disturbed land will be reclaimed.

[1] A total of 86 acres of mountain shrub occur in MLRA 36 and 4 acres in MLRA 39.

[2] A total of 274 acres of grassland occur in MLRA 36 and 102 acres in MLRA 42.

preconstruction conditions within 5 years after construction with effective use of the erosion control, reclamation, and revegetation program outlined in Appendix 2. Overstory vegetation (trees and shrubs) would take longer to revegetate, but only small areas (at tower sites and beneath the lines) of overstory vegetation would be disturbed, of which a large portion would be trimmed. See Table 2-14 for the estimated acreage of each major vegetation type that would be disturbed by construction and installation of the transmission line and associated facilities.

Livestock Grazing

AFFECTED ENVIRONMENT

The land ownership, ranching operations, and grazing-carrying capacities of lands along the alternative route are similar to those along the Proposed Action route. Table 2-15 shows the locations and number of ranch headquarters, dwellings, and livestock watering facilities within 250 feet of the alternative transmission line.

IMPACTS

An estimated annual 59 AUMs of forage would be lost along this route for 1 to 5 years on approximately 645 acres, spread along 215 miles. Forage lost by transmission line construction would be well below the 1 percent significance criterion and, therefore, considered insignificant. The invasion of poisonous and invader plants on disturbed areas would not be significant. The transmission line would cross directly over or within 250 feet of one ranch headquarters and eight livestock watering facilities. See the Proposed Action section for discussion of land disturbance, forage loss, and the effects of transmission line operation.

Socioeconomics

AFFECTED ENVIRONMENT

The area of influence for population, employment, and per capita personal income analysis for the Very Large Array Alternative is the same as for the Proposed Action. The area of influence for revenue analysis differs from that for the Proposed Action only in the addition of the Reserve School District in Catron County.

IMPACTS

Impacts from construction of the Very Large Array Alternative would be insignificant, the same as those from construction of the Proposed Action. Impacts to

TABLE 2-15
DISTANCE OF THE VERY LARGE ARRAY ALTERNATIVE (A) FROM RANCH HEADQUARTERS, DWELLINGS, AND LIVESTOCK WATERING FACILITIES[1]

Location by Milepost	Distance to Ranch Headquarters and Dwellings (Ft)[2]	Distance to Livestock Watering Facilities (Ft)[3]	Additional Notes
0.3A	250–500		
0.4	0–250*		
1.6		0–250*	
27.9		250–500	
33.7A	500–1,000		Ranch Hq.
48.8A		0–250*	Windmill
71.3A		500–1000	Well
71.6A		500–1,000	Tank
74.4A		0–250*	Well
75.2A		0–250*	Well
81.8A		0–250*	Well
83.0A		0–250*	Water Tower
86.6A		0–250*	Water Tower
95.5A		500–1,000	Windmill
118.3A		500–1,000	Pond
126.1A		250–500	Pond
157.0A	500–1,000		Dwelling
157.2A		250–500	Windmill
157.3A	0–250*		Well
163.8A		500–1,000	Spring
166.8A	500–1,000		Dwelling
167.0A		0–250*	Pond (Intermittent)
169.3A	500–1,000		Dwelling
182.0A		250–500	Windmill
188.3A		250–500	Windmill

SOURCE: Locations of ranch headquarters, dwellings, and watering facilities recorded from the latest U.S. Geological Survey topographic maps, scale 1:24,000, supplemented with BLM and local land status maps.

*Facilities occurring within the 250-foot distance of concern.

[1] Includes ranch headquarters, dwellings, and livestock watering facilities within 1,000 feet of the transmission line.

[2] Includes livestock watering facilities when associated with the ranch headquarters and dwellings.

[3] Includes livestock watering facilities (tank, pond, and windmill) not associated with ranch headquarters.

population, employment, and per capita personal income from transmission line operation would also be the same as for the Proposed Action. Impacts to local government revenue as shown on Table 2-16 would be insignificant, varying from 1 percent in Catron and Sierra counties to less than 1 percent in the other jurisdictions. The livestock grazing industry would not have any significant losses as supported by the Livestock Grazing section.

TABLE 2-16
IMPACTS TO LOCAL GOVERNMENT REVENUE FROM CONSTRUCTION AND OPERATION OF THE VERY LARGE ARRAY ALTERNATIVE (A)

County and School District	Baseline Revenue*	Revenue Increases over Baseline*	Percentage Increase over Baseline
Construction (1986-1987)			
Catron County	$1,398	$ 2	0.1
Quemado School District	1,116	1	0.1
Reserve School District	1,525	0	0.0
Luna County	2,927	1	**
Deming School District	9,022	1	**
Sierra County	1,246	1	0.1
Truth or Consequences School District	3,550	**	**
Socorro County	1,964	0	0.0
Magdalena School District	1,652	0	0.0
Operation (1990)			
Catron County	$1,527	$21	1.4
Quemado School District	1,253	3	0.2
Reserve School District	1,713	2	0.1
Luna County	3,013	18	0.6
Deming School District	9,285	10	0.1
Sierra County	1,259	12	1.0
Truth or Consequences School District	3,585	5	0.1
Socorro County	1,977	4	0.2
Magdalena School District	1,669	4	0.2

See Appendix 8 for data sources and analysis methods.

*Figures are given in thousands of dollars.

**Less than $500 or 0.05 percent.

Terrestrial Wildlife

AFFECTED ENVIRONMENT

The Very Large Array Alternative would cross the same habitat (vegetation) types that would be crossed by the Proposed Action route. The wildlife species in each of the 12 types are listed in the Proposed Action section. Table 2-16 The Very Large Array Alternative would affect the same wildlife species as the Proposed Action (about 96 species of mammals and an estimated 266 species of birds). This route would cross 139 miles of mule deer habitat, 59 miles of pronghorn range, 69 miles of black bear habitat, 99 miles of javelina range, 37 miles of turkey range, and 80 miles of quail habitat. (See Table 2-17 for wildlife species that would be affected by the alternative.)

IMPACTS

Impacts to terrestrial wildlife species (mammals and birds) during construction, operation, maintenance, and abandonment of the alternative would be similar to those from the Proposed Action. Table 2-17 lists the acres of habitat type that would be disturbed by construction of this route.

TABLE 2-17
WILDLIFE SPECIES AND HABITATS AFFECTED BY THE VERY LARGE ARRAY ALTERNATIVE (A)

Wildlife Species	Miles of Occupied Habitat	Crucial Habitats	Habitat Trends[1]	Population Estimate	Population Trend	Acres of Temporarily Disturbed[2]
Mule Deer						
MP 10A-12A	2	None	stable (4)	1.00 deer/Sec.	increasing	6
MP 67A-95A	28	None	stable (5)	3.00 deer/Sec.	decreasing	84
MP 95A-118A	23	None	stable (4)	0.75 deer/Sec.	decreasing	69
MP 228A-138A	20	Winter Range MP130A-134A	stable (3)	0.3 deer/Sec.	decreasing	60
MP 149A-215A	66	Winter Range MP181A-188A	stable (5)	0.70 deer/Sec.	decreasing	198
TOTAL:	139					417
Pronghorn						
MP 96A-155A	59	None	stable (7)	175	decreasing	177
Black Bear						
MP 87A-118A	31	None	stable	125	decreasing	93
MP 130A-142A	12	None	stable	5	stable	36
MP 153A-170A	17		stable	20	stable	51
MP 178A-187A	9		stable	50	decreasing	27
TOTAL:	69					207
Javelina						
MP 0A-93A	93	None	stable	2,500	decreasing	279
MP 150A-156A	6	None	stable	25	stable	18
TOTAL:	99					297
Turkey						
MP 88A-109A	21	None	stable	2,000	increasing	63
MP 186A-202A	16	None	stable	800	increasing	48
TOTAL:	37					110

TABLE 2-17 (Concluded)
WILDLIFE SPECIES AND HABITATS AFFECTED
BY THE VERY LARGE ARRAY ALTERNATIVE (A)

Wildlife Species	Miles of Occupied Habitat	Crucial Habitats	Habitat Trends[1]	Population Estimate	Population Trend	Acres of Temporarily Disturbed[2]
Quail						
MP 0A-80A	80		stable	not calculated	N/A	240

SOURCE: Based on the wildlife distribution, population estimates, and habitat classifications on computerized maps furnished by the Technology Application Center, University of New Mexico, using data from the New Mexico Department of Game and Fish (current as of July 1982).

[1]The numbers in parentheses are judgmental ratings from the New Mexico Department of Game and Fish of the quality of the occupied habitat ranging from 1 to 10 (1 = the lowest possible quality; 10 = the highest).

[2]These are areas of habitat that would be temporarily disturbed and then revegetated. Revegetation is expected to be complete in 3 to 5 years.

SAN AGUSTIN ALTERNATIVE (B)

Electromagnetic Interference

AFFECTED ENVIRONMENT

The affected environment for the San Agustin Alternative would be the same as described for the Proposed Action.

IMPACTS

The alternative transmission line would be located so that it is entirely shielded by terrain from the VLA and, therefore, would not interfere with the VLA to any measurable extent. If the VLA antenna sights are extended 13 miles to the southwest as planned, the closest point on the transmission line would be at MP 165B, or approximately 13 miles from the end of the antenna. The calculated EMI at the future antenna site would be -270 dBW/m^2/Hz, which is below the threshold of -260 dBW/m^2/Hz and therefore insignificant.

This alternative would allow an additional extension of the present VLA, if needed—a total of 23 miles beyond the present southwest antenna sight.

The alternative route would turn west at MP 96.5B, 5 miles south of the future Dusty VLBA site. The calculated EMI is -254 dBW/m^2/Hz which, when compared to the threshold value of -235 dBW/m^2/Hz, would be well below the significance criterion and therefore insignificant.

Visual Resources

AFFECTED ENVIRONMENT

The San Agustin Alternative would cross both of the physiographic provinces described for the Proposed Action: the Basin and Range and the Colorado Plateaus (Fenneman 1931), changing at about MP 175B. Cultural modifications visible on the landscape along the route are similar to those along the Proposed Action route.

The landscape in three of the five VRM classes would be affected by this alternative. In addition, the route would cross areas in the Gila National Forest having the Visual Quality Objectives (VQO) of Partial Retention and Modification. For purposes of comparison, VQOs of Partial Retention and Modification most closely relate to VRM Classes III and IV; see Appendix 5 for definitions of terms. Table 2-18 summarizes the existing areas, by milepost, that would be crossed by the alternative.

TABLE 2-18
TOTAL MILES OF VISUAL RESOURCE MANAGEMENT CLASSES AND VISUAL QUALITY OBJECTIVES AFFECTED BY THE SAN AGUSTIN ALTERNATIVE (B)

Milepost	Number of Miles	Class II	Class III	Class IV	VQO Partial Retention	VQO Modification
0–9.5B	9.5		9.5			
9.5B–13.0B	3.5	3.5				
13.0–24.5B	11.5		11.5			
24.5–26.0B	1.5	1.5				
26.0–27.5B	1.5			1.5		
27.5–35.0B	7.5	7.5				
35.0–50.5B	15.5	15.5				
50.5–54.5B	4.0		4.0			
54.5–83.0B	28.5			28.5		
83.0–96.0B	13.0		13.0			
96.0–99.5B	3.5			3.5		
99.5–108.5B	9.0					9.0
108.5–111.5B	3.0			3.0		
111.5–115.5B	4.0					4.0
115.5–120.5B	5.0				5.0	
120.5–131.5B	11.0		11.0			
131.5–137.5B	6.0	6.0				
137.5–151.0B	13.5					13.5
151.0–170.0B	19.0	19.0				
170.0–187.0B	17.0			17.0		
187.0–194.0B	7.0		7.0			
194.0–206.5B	12.5			12.5		
206.5–207.5B	1.0		1.0			
207.5–210.0B	2.5			2.5		
210.0–213.0B	3.0		3.0			
213.0–215.5B	2.5			2.5		
215.5–219.5B	4.0		4.0			
219.5–223.5B	4.0			4.0		
223.5–224.5B	1.0		1.0			
224.5–228.0B	3.5			3.5		
(End)						
TOTAL:	228.0	37.5	54.0	105.0	5.0	26.5

Refer to Appendix 5, Visual Resource Management Methodologies, for definitions of terms.

The San Agustin route would cross 37.5 miles of VRM Class II areas, generally around and south of the Cooke Range, in the Nutt area, and in the Plains of San Agustin. The route would cross 54 miles of VRM Class III areas between Deming and Nutt, in the lowlands north of Winston, south of Omega, and in the Red Hill cinder cone area. Class IV areas account for 105 miles of the route and include the remaining areas outside the Gila National Forest (BLM 1981, 1982, 1983a). The alternative route would cross 5 miles of VQO Partial Retention areas and 26.5 miles of VQO Modification areas within the Gila National Forest (FS 1984a).

IMPACTS

The impacts from this alternative are described on Table 2-19. The San Agustin Alternative would significantly affect 10.5 miles of VRM Class II areas, 41 miles of Class III areas, and 2.5 miles of Class IV areas. No VQOs of Partial Retention or Modification would be significantly affected by the alternative transmission line. The primary significant adverse visual resource impacts would result from placing the transmission line on the natural-appearing landscape. Generally, the modifications would not meet the standards of the

TABLE 2-19
SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS CAUSED BY THE SAN AGUSTIN ALTERNATIVE (B)[1]

Milepost	Number of Miles	Existing VRM Class[2]	Primary Viewpoints and Description of Impacts[3]
0.0–26.0B	5.0 21.0	II III	Viewed from U.S. Highway 180, State Highway 26, 21.0 III and rural residences as fg/mg. Would add to cumulative impacts of existing transmission lines. Lines are dominant elements in terms of scale.
26.0–32.0B	1.5 4.5	II III	Viewed from State Highway 27 as fg/mg. Would add 4.5 III elements of form and line to natural-appearing landscape.
52–56B	3.0 1.0	III IV	Viewed from State Highway 90 as fg/mg. Would add 1.0 IV elements of form and line to natural-appearing landscape.
83–85B	2.0	III	Viewed from State Highway 52 and community of Winston as fg/mg. Contrasts in addition of form and line elements of transmission line, and form, line, color, and textural changes in vegetation removal.
89–97B	6.5 1.5	III IV	Viewed from State Highways 52 and 59 as fg/mg. 1.5 IV Contrasts in elements of form and line in a natural-appearing landscape.
154.5–155.5B	1.0	II	Viewed from State Highway 12 and ranch headquarters as fg/mg. Contrasts in elements of form and line scale would dominate natural-appearing landscape.
166–169B	3.0	II	Viewed from a county road and Horse Mountain WSA as fg/mg. Contrasts in elements of form and line would attract attention and create a dominant feature in terms of scale in the natural-appearing landscape.
187.5–191.5B	4.0	III	Viewed from county road along Mangus Creek as fg/mg. Contrasts in elements of form and line, and would dominate the existing landscape in terms of scale.

[1] All visual resource impacts would be caused by adding transmission towers and conductors to the landscape, unless otherwise noted.

[2] Refer to Appendix 5, Visual Resource Management Methodologies, for definitions of terms.

[3] All impacts would last for the life of the project—until the transmission line is removed.

Distance Zones: fg = foreground; mg = middleground; bg = background;
fg/mg = foreground/middleground.

VRM class for the areas where the project would be located.

Significant impacts are summarized for the following areas of concern: 26 miles of the project that would be viewed from U.S. Highway 180 and State Highway 26 between Deming and Nutt; 20 miles viewed from State Highways 27, 90, 52, and 59; only 1 mile within the Plains of San Agustin because the route would be designed to reduce impacts to this unique and highly

scenic landscape; and 3 miles of the route that would cross other areas of high scenic quality. The impacts where the route crossed U.S. Highway 60 would most likely be insignificant since accepted design techniques for project alignment across a highway were used. Impacts along the remainder of the route would be insignificant.

Cultural Resources

AFFECTED ENVIRONMENT

The cultural resources along the San Agustin Alternative route would be similar to those along the Proposed Action route. The San Agustin Alternative has been crossed 16 times by cultural resource inventories for seismic tests or right-of-way inventories. Over 36 known cultural sites have been identified within a 1-mile-wide corridor centered along the route. These sites include lithic scatters or campsites that may relate to Paleo-Indian or Archaic occupations or to any of the more recent Indian occupations. Identified site types include pueblos, lithic scatters, caves, quarrys, and historic homesteads. Four sites are Mogollon. The alternative would cross only one known Historic site, the Magdalena livestock driveway, at MP 180B.

The following sites or classes of sites are either on or determined eligible for listing on the National Register of Historic Places: Mogollon Pueblo (Cox Ranch Pueblo), the Magdalena livestock driveway, Paleo-Indian, Archaic, Mogollon-Mimbres, Anasazi (Chacoan), Animas, and Salado. Areas of high site probability can be found between MP 81B and 96.5B and between MP 194B and 228B.

IMPACTS

Impacts from the San Agustin Alternative would be similar to those identified for the Proposed Action.

Wilderness

AFFECTED ENVIRONMENT

The San Agustin Alternative route would be located 3 miles or less from five BLM-administered WSAs: Mesita Blanca (NM-020-018), Eagle Peak (NM-020-019), Cooke's Range (NM-030-031), Horse Mountain (NM-020-043), and Continental Divide (NM-020-44). The Mesita Blanca, Eagle Peak, and Cooke's Range WSAs are discussed in the Proposed Action, Wilderness section. The Horse Mountain and Continental Divide WSAs are discussed in the Very Large Array Alternative, Wilderness section. (The San Agustin Alternative would pass 1.8 miles south of the Continental Divide WSA, between MP 122B and 127B.)

IMPACTS

No significant, direct impacts to the wilderness resource are anticipated as a result of the alternative route crossing any wilderness units since no crossings would occur. Outside sights created by the alternative near the unit boundaries may affect the users of four of the units. The significance of the impacts would depend on the user's perspective and viewpoints. See the Proposed Action, Wilderness section, for a discussion of the impacts to the Mesita Blanca and Eagle Peak WSAs and the Very Large Array Alternative for a discussion of impacts to the Horse Mountain and Continental Divide WSAs.

Between MP 122B and 127B, little if any topographic or vegetation screening would separate the San Agustin Alternative route from the southern portion of the Continental Divide WSA. Within the WSA, visitors could view the transmission line along the unit's boundary. No other cultural modifications occur immediately south of the WSA, except State Highway 78, which is generally topographically screened from WSA users by Railroad Canyon.

Recreation Resources

AFFECTED ENVIRONMENT

The San Agustin Alternative would affect the same environment as the Proposed Action and Very Large Array Alternative (Map 1-2). At MP 116B, the route would cross State Highway 78 through Railroad Canyon, the main access route into the southern portion of the Continental Divide WSA. Primitive recreation opportunities along the route south of the WSA include deer and antelope hunting, sightseeing, hiking, and ORV use.

The San Agustin Alternative would cross the CDNST planning corridor five times at MP 5B, 104B, 134B, 181B, and 201B. See the Proposed Action and Very Large Array Alternative sections for more details on the CDNST.

IMPACTS

Impacts from this alternative would be similar to those from the Proposed Action and Very Large Array Alternative.

Soils and Vegetation

AFFECTED ENVIRONMENT

The San Agustin Alternative would cross landscape and terrain similar to that of the Proposed Action. The alternative would not cross the Plains of San Agustin but would pass along the western edge between MP 135B and 165B. This alternative would cross 72 miles of MLRA 42, 122 miles of MLRA 36, and 34 miles of MLRA 39. See Map 2-1 for location of MLRAs within the project area and the Proposed Action discussion for descriptions of MLRAs.

The San Agustin Alternative would affect major soil groups and vegetation types, similar to those of the Proposed Action. Table 2-20 shows the location and extent of the larger areas of unfavorable soils and terrain requiring more intensive reclamation and erosion control, and Table 2-21 shows the miles of vegetation that would be crossed. See Appendix 7 for a brief description of generalized soil groups and vegetation types.

TABLE 2-20
AREAS REQUIRING MORE INTENSIVE RECLAMATION AND EROSION CONTROL: SAN AGUSTIN ALTERNATIVE (B)

	SENSITIVE AREA DESCRIPTION AND COMMENTS			
Location By Milepost	**Extent Miles (Acres)**	**Slopes (15% +)**	**Unfavorable Soils Properties***	**Other**
0.0B-4.2B	4.2		X	Sandy Soils, (Coppice Dunes)
10.4B-10.8B	0.4	X	X	
38.4B-39.4B	1.0	X	X	
39.7B-40.0B	0.3	X	X	Drainageway
41.4B-41.8B	0.4	X	X	Drainageway
43.4B-44.6B	1.3	X	X	Drainageway
46.9B-48.1B	1.2	X	X	Drainageway
48.8B-49.2B	0.4	X	X	Drainageway
49.5B-49.6B	0.1	X	X	Drainageway
50.0B-50.1B	0.1	X	X	
55.9B-56.2B	0.3	X	X	Escarpment
56.7B-56.9B	0.2	X	X	
57.8B-58.1B	0.3	X	X	
64.1B-65.5B	1.3	X	X	Drainageway
66.2B-67.1B	0.9	X	X	
67.7B-68.0B	0.3	X	X	Drainageway
69.3B-69.5B	0.2	X	X	
70.8B-71.3B	0.5	X	X	
73.9B-76.3B	2.4	X	X	
76.5B-76.9B	0.4	X	X	
80.4B-81.0B	0.6	X	X	
83.0B-83.7B	0.7	X	X	
95.2B-96.4B	1.2	X	X	
97.0B-98.0B	1.0	X	X	
99.8B-100.7B	0.9	X	X	Escarpment
103.0B-103.1B	0.1	X	X	Mountain area
103.4B-103.8B	0.4	X	X	Mountain area
108.1B-108.6B	0.5	X	X	Mountain area
112.1B-112.3B	0.2	X	X	Mtn. Sideslope
114.1B-114.5B	0.4	X	X	Mtn. Drainageway
114.7B-114.9B	0.2	X	X	Mtn. Drainageway
117.6B-117.7B	0.1	X	X	Mtn. Drainageway
120.1B-120.6B	0.5	X	X	

TABLE 2-20 (Concluded)
AREAS REQUIRING MORE INTENSIVE RECLAMATION AND EROSION CONTROL: SAN AGUSTIN ALTERNATIVE (B)

Location By Milepost	SENSITIVE AREA DESCRIPTION AND COMMENTS			
	Extent Miles (Acres)	Slopes (15% +)	Unfavorable Soils Properties*	Other
121.0B-121.2B	0.2	X	X	
121.8B-122.0B	0.2	X	X	
126.4B-126.6B	0.2	X	X	Drainageway
127.7B-127.8B	0.1	X	X	Drainageway
130.8B-131.0B	0.2	X	X	Mtn. Sideslope
134.0B-134.4B	0.4	X	X	Mtn. Sideslope
139.7B-143.5B	3.8	X	X	Mtn. Sideslope
144.8B-145.0B	0.2	X	X	
146.0B-146.4B	0.4	X	X	
147.7B-147.9B	0.2	X	X	Mtn. Sideslope
148.1B-149.2B	1.1	X	X	Mtn. Sideslope
149.9B-151.0B	1.1	X	X	Mtn. Sideslope
152.5B-153.0B	0.5	X	X	Mtn. Sideslope
153.5B-154.3B	0.8	X	X	Mtn. Sideslope
156.2B-156.4B	0.2	X	X	Mtn. Sideslope
157.1B-157.4B	0.3	X	X	Mtn. Sideslope
157.8B-158.4B	0.6	X	X	Mtn. Sideslope
161.9B-162.0B	0.1	X	X	Mtn. Sideslope
163.1B-163.8B	0.7	X	X	Mtn. Sideslope
167.8B-168.1B	0.3	X	X	Mtn. Sideslope
168.2B-168.9B	0.7	X	X	Mtn. Sideslope
171.3B-172.9B	1.6	X	X	Mtn. Sideslope
176.6B-177.0B	0.4	X	X	Mtn. Sideslope
178.0B-178.2B	0.2	X	X	Mtn. Sideslope
179.1B-179.3B	0.2	X	X	Mtn. Sideslope
194.3B-194.5B	0.2	X	X	Drainageway
194.7B-194.9B	0.2	X	X	
198.2B-198.6B	0.4	X	X	Drainageway
198.8B-199.5B	0.7	X	X	Drainageway
202.8B-203.7B	0.9	X	X	Drainageway
204.7B-204.9B	0.2	X	X	Escarpment
224.7B-225.8B	1.1	X	X	Volcanic
TOTAL:	41.4 (124)			

NOTE: Table prepared from soils-terrain analysis and orthophotograph interpretations. Milepost locations are approximate, based on general, preliminary right-of-way information.

*Unfavorable soil property parameters:
— shallow over bedrock
— underlain by hard bedrock
— sandy loam sand and clay textured surface and subsoil layers
— containing more than 35 percent coarse fragments by volume, exceeding sizes of 3 inches in diameter
— permeability less than 0.6 inch per hour
— water table less than 72 inches below surface
— soil reaction with pH value greater than 8.5, salinity more than 16 millimhos in the upper 40 inches
These soils will require more intensive reclamation and erosion control.

TABLE 2–21
VEGETATION TYPES AFFECTED AND DISTURBED BY THE SAN AGUSTIN ALTERNATIVE (B)

Vegetation Type	Miles Crossed	Acres Disturbed
Riparian	1.5	4
Pseudoriparian	1.8	5
Pinyon-Juniper	41.4	153
Mixed Conifer	4.2	17
Mountain Meadow	2.6	11
Mountain Shrub[1]	33.0	118
Creosote Bush	17.6	53
Mesquite-Grassland	9.0	18
Mesquite-Dunal	6.0	16
Sagebrush-Grassland	1.5	5
Yucca-Grassland	0.8	2
Grassland[2]	108.6	315
TOTAL:	228.0	717

Refer to Appendix 7 for source of data and description of vegetation types. All disturbed land will be reclaimed.

[1] A total of 79 acres of mountain shrub occur in MLRA 36 and 39 acres in MLRA 39.

[2] A total of 91 acres of grassland occur in MLRA 42 and 224 acres in MLRA 36.

(Revegetation potential and erosion control needs would be the same for soils affected by this alternative as for those affected by the Proposed Action.)

IMPACTS

The San Agustin Alternative would disturb 717 acres, all of which would be reclaimed. Types of land disturbance would be the same as from the Proposed Action.

The transmission line would cross 41.4 miles of soils and terrain most susceptible to impacts. These areas are sensitive because they contain less favorable soil, slope, and climatic conditions than other areas along the route; are more susceptible to erosion hazards; and have a lower revegetation potential. See Table 2–20 for location and extent of sensitive soil areas. Soil impact potential would be similar to that of the Proposed Action route. Impacts to soils would be insignificant.

Overstory vegetation (mainly trees) would be permanently removed or growth-controlled to allow access and provide safe transmission line operation. Disturbed areas would be small and generally insignificant, except in forested areas where timber is marketable, mainly within the mixed conifer vegetation type.

Impacts to vegetation would generally be insignificant. Understory vegetation would return to near-preconstruction conditions within 5 years after construction with effective use of the erosion control, reclamation, and revegetation program outlined in Appendix 2. Overstory vegetation (trees and shrubs) would take longer to become established, but generally only small areas (at tower sites and beneath the lines) of overstory vegetation would be disturbed. Larger areas of disturbance may be required in steeper terrain. See Table 2–21 for the estimated acreage of each major vegetation type that would be disturbed by construction and installation of the transmission line and associated facilities.

Livestock Grazing

AFFECTED ENVIRONMENT

The land ownership, ranching operations, and grazing-carrying capacities of lands along the San Agustin Alternative route would be similar to those of the Proposed Action. Table 2–22 shows the locations and number of ranch headquarters, dwellings, and livestock watering facilities within 250 feet of the alternative transmission line.

IMPACTS

An estimated annual 66 AUMs of forage would be lost along this route for 1 to 5 years on approximately 717

TABLE 2-22
DISTANCE OF THE SAN AGUSTIN ALTERNATIVE (B) FROM RANCH HEADQUARTERS, DWELLINGS, AND LIVESTOCK WATERING FACILITIES[1]

Location by Milepost	Distance to Ranch Headquarters and Dwellings (Ft)[2]	Distance to Livestock Watering Facilities (Ft)[3]	Additional Notes
0.3B	250–500		
0.4B	0–250*		
1.6B		0–250*	
4.4B		500–1,000	
9.7B			Gravel Pit, 0–250 feet
14.5B	250–500		Community of Florida
17.0B	500–1,000		
22.5B		250–500	
26.9B	0–250*		Ranch Head-quarters
28.5B	250–500		
30.1B		250–500	Windmill
34.8B	500–1,000		Ranch Head-quarters
49.8B		0–250*	Windmill
72.3B		500–1,000	Well
72.6B		500–1,000	Tank
75.4B		0–250*	Well
76.2B		0–250*	Well
82.8B		0–250*	Well
84.0B		0–250*	Water Tower
87.6B		0–250*	Water Tower
96.5B		500–1,000	Windmill
108.5B		0–250*	Tank
116.3B		500–1,000	Tank
130.7B		0–250*	Tank
136.0B		0–250*	Tank
141.7B		500–1,000	Tank
147.3B		0–250*	Tank
160.3B		250–500	Tank
169.8B	500–1,000	250–500	Windmill
170.0B		250–500	Windmill
170.1B		250–500	Well
176.6B	500–1,000		Spring
179.7B	500–1,000		Dwelling
179.9B			Pond (Intermittent)
182.1B	500–1,000		Dwelling
194.8B		250–500	Windmill
201.1B		250–500	Windmill

SOURCE: Locations of ranch headquarters, dwellings, and watering facilities recorded from the latest U.S. Geological Survey topographic maps, scale 1:24,000, supplemented with BLM and local land status maps.

*Facilities occurring within the 250-foot distance of concern.

[1] Includes ranch headquarters, dwellings, and livestock watering facilities within 1,000 feet of the transmission line.

[2] Includes livestock watering facilities when associated with the ranch headquarters and dwellings.

[3] Includes livestock watering facilities (tank, pond, and windmill) not associated with ranch headquarters.

acres spread along 228 miles. Types of land disturbance would be the same as from the Proposed Action.

Forage lost by transmission line construction would be well below the 1 percent significance criterion and therefore considered insignificant. The invasion of poisonous and invader plants on disturbed areas would not be significant. The transmission line would cross within 250 feet of 2 ranch headquarters and dwellings and 11 livestock watering facilities. See the Proposed Action section for discussion of land disturbance, forage loss, and the effects of transmission line operation.

Socioeconomics

AFFECTED ENVIRONMENT

The area of influence for population, employment, and per capita personal income analysis for the San Agustin Alternative is the same as for the Proposed Action and the Very Large Array Alternative.

IMPACTS

Construction. Construction of the San Agustin Alternative would not cause any significant impacts. See Tables 2-23 and 2-24 for data relating to population,

TABLE 2-23
IMPACTS TO POPULATION, EMPLOYMENT, AND PER CAPITA INCOME FROM CONSTRUCTION OF THE SAN AGUSTIN ALTERNATIVE (B)

County and Community	Baseline	Increase over Baseline	Percentage Increase over Baseline
Population			
Apache County	62,500	60	N/A*
Springerville-Eagar	5,920	60	1.0
Catron County	2,900	20	N/A*
Datil	220	10	4.5
Quemado-Omega	350	10	2.9
Luna County	16,700	80	N/A*
Deming	10,830	80	0.7
Sierra County	9,100	50	N/A*
Truth or Consequences Williamsburg	6,170	50	0.8
Socorro County	14,500	70	N/A*
Magdalena	1,210	10	0.8
Socorro	8,960	60	0.7
Total Employment			
Apache County	18,000	80	0.4
Catron County	900	20	2.2
Luna County	4,900	110	2.2
Sierra County	2,800	60	2.1
Socorro County	5,000	80	1.6
Per Capita Personal Income			
Apache County	$ 5,948	$ 5,974	0.4
Catron County	6,230	6,345	1.8
Luna County	7,835	7,949	1.5

TABLE 2-23 (Concluded)
IMPACTS TO POPULATION, EMPLOYMENT, AND PER CAPITA INCOME FROM CONSTRUCTION OF THE SAN AGUSTIN ALTERNATIVE (B)

County and Community	Baseline	Increase over Baseline	Percentage Increase over Baseline
Sierra County	9,274	9,385	1.2
Socorro County	6,321	6,433	1.8

See Appendix 8 for data sources and analysis methods.

*N/A = not applicable; the significance of population increase is measured for communities because they have to provide the facilities and services.

TABLE 2-24
IMPACTS TO LOCAL GOVERNMENT REVENUE FROM CONSTRUCTION AND OPERATION OF THE SAN AGUSTIN ALTERNATIVE (B)

County and School District	Baseline*	Revenue Increases over Baseline*	Percentage Increase over Baseline
Construction (1986–1987)			
Catron County	$1,398	$ 2	0.1
Quemado School District	1,116	**	**
Reserve School District	1,525	**	**
Luna County	2,927	1	**
Deming School District	9,022	1	**
Sierra County	1,246	1	0.1
Truth or Consequences School District	3,550	**	**
Socorro County	1,964	0	0.0
Magdalena School District	1,652	0	0.0
Operation (1990)			
Catron County	$1,527	$36	2.4
Quemado School District	1,253	4	0.3
Reserve School District	1,713	7	0.4
Luna County	3,013	19	0.6
Deming School District	9,285	10	0.1
Sierra County	1,259	12	1.0
Truth or Consequences School District	3,585	5	0.1
Socorro County	1,977	1	0.1
Magdalena School District	1,669	1	0.1

See Appendix 8 for data sources and analysis methods.

*Figures are given in thousands of dollars.

**Less than $500 or 0.05 percent.

employment, per capita personal income, and local government revenue. Between 1986 and 1987, population growth is expected to range from 4 percent in Datil and 3 percent in the Quemado-Omega area to 1 percent or less in the other communities. Total employment growth would vary from 2 percent in Catron, Luna, and Sierra counties to less than 1 percent in Apache County. Per capita personal income increase would range from 2 percent in Catron and Socorro counties to less than 1 percent in Apache County. Local government revenue would rise less than 1 percent in all jurisdictions. All of these impacts fall below the 10 percent significance criteria. As a result, the effects on housing, public services and facilities, and social conditions in the area of influence would be insignificant.

The livestock grazing industry would not have any significant losses as a result of transmission line construction. Short-term timber production would not be affected by construction because the timber salvaged from the right-of-way would be counted as part of the year's allowable cut. No other local industry sectors would be affected by construction.

Operation. Impacts to population, employment, and per capita personal income from transmission line operation would be the same as from the Proposed Action. Impacts to local government revenue (Table 2-24) would be insignificant, varying from 2 percent in Catron County and 1 percent in Sierra County to less than 1 percent in the other jurisdictions, all well below the 10 percent significance criteria. No significant losses to the livestock grazing and timber industries would occur from construction or operation of this alternative.

Transportation Networks

AFFECTED ENVIRONMENT

The affected environment for the San Agustin Alternative would be similar to that of the Proposed Action except for a portion of the alternative route that would pass through the Gila National Forest. See Table 2-25 for a brief description of the traffic data for the major roads along the San Agustin Alternative route.

IMPACTS

The San Agustin Alternative would increase traffic volume on roadway segments of U.S. Highway 60 and State Highways 78, 12, 52, 90, 27, and 26. Project-related traffic could add as many as 117 vehicle trips per day to the roadway segments. U.S. Highway 60 and State Highways 26 and 90 could sustain the increased auto and truck traffic without lowering the level-of-service; the other highway segments could not.

See Table 2-25 for baseline and traffic accident data and projected increases from the San Agustin Alternative.

Impacts from the San Agustin Alternative would be similar to those from the Proposed Action. Increased project-related traffic on roadway segments would increase accidents by 13.2 per year; 4.1 of these accidents could occur at intersections and junctions.

Terrestrial Wildlife

AFFECTED ENVIRONMENT

The San Agustin Alternative route would cross similar but more diverse habitat (vegetation) types than the Proposed Action route. The wildlife species in these habitat types are listed in the Proposed Action section.

The San Agustin Alternative would affect similar wildlife species as the Proposed Action and would also affect elk habitat. The alternative would cross 157 miles of mule deer habitat, 40 miles of elk habitat, 79 miles of pronghorn range, 89 miles of black bear habitat, 102 miles of javelina range, 54 miles of turkey range, and 81 miles of quail habitat. (See Table 2-26 for wildlife species that would be affected by the alternative.)

IMPACTS

Impacts to mammals and birds during the construction, operation, maintenance, and abandonment of this alternative would be similar to those discussed for the Proposed Action. See Table 2-26 for the acres of habitat that would be disturbed by construction of this alternative.

Forest Management

SIGNIFICANCE CRITERIA

Impacts to forest management were considered significant if:

- any constraints or conflicts were identified between proposed project facilities or activities and the Forest Service land use plans and goals of the plans.

TABLE 2-25
TRAFFIC ACCIDENT DATA: BASELINE 1986 AND PROJECTED INCREASES FROM THE SAN AGUSTIN ALTERNATIVE (B)

Roadway Segments	Total Miles of Roadway Segments	AVERAGE DAILY TRAFFIC		TOTAL ACCIDENTS		Projected Increased Accidents	Percent of Accidents at Junctions (1986)	Projected Accidents at Junctions
		1986	Projected	1986	Projected			
State Highway 26 between Junction of U.S. 180 and Junction of Interstate 25	47	1,426	1,542	19	20.4	1.4	6	0.0
State Highways 52 and 78 between Junction of Interstate 25 and Junction of State Highway 78 to U.S. 60	91	135	251	13	19.0	6.0	50	3.0
State Highway 12, between Junction of U.S. 60 and Horse Springs	21	221	337	5	6.7	1.7	0	0.0
U.S. Highway 60 between Arizona state line and Socorro	139	835	951	34	38.1	4.1	27	1.1
TOTAL:	298	N/A	N/A	71	84.2	13.2	N/A	4.1

SOURCE: New Mexico State Highway Commission 1983.

NOTE: Projected baseline calculated on the basis of a 1.5 percent annual population increase; N/A = Not Applicable.

TABLE 2-26
WILDLIFE SPECIES AND HABITATS AFFECTED
BY THE SAN AGUSTIN ALTERNATIVE (B)

Wildlife Species	Miles of Occupied Habitat	Crucial Habitats	Habitat Trends[1]	Population Estimate	Population Trend	Acres of Temporarily Removed[2]
Mule Deer						
MP 67B-96B	29	None	stable (5)	3.00 deer/Sec.	decreasing	87
MP 96B-120B	24	None	stable (4)	0.75 deer/Sec.	decreasing	95
MP 120B-135B	15	None	stable (3)	0.30 deer/Sec.	decreasing	60
MP 135B-141B	6	Winter Range MP193B-200B	stable (5)	0.70 deer/Sec.	decreasing	4
TOTAL:	157					266
Elk						
MP 99B-109B	10		stable (3)	125	stable	40
MP 111B-121B	10	stable (7)	150	stable	40	
MP 135B-155B	20	decreasing (6)	100	stable	77	
TOTAL:	40					157
Pronghorn						
MP 9B-27B	18	None	stable (5)	75	stable	37
MP 95B-100B	5	None	stable (7)	150	decreasing	18
MP 108B-147B	39	None	stable (7)	150	decreasing	156
MP 151B-168B	17	None	stable (7)	150	decreasing	52
TOTAL:	79					263
Black Bear						
MP 88B-115B	27	None	stable	120	increasing	99
MP 130B-183B	53	None	stable	75	stable	181
MP 191B-200B	9	None	stable	50	decreasing	27
TOTAL:	89					307
Javelina						
MP 0B-98B	98	None	stable	2,500	increasing	273
MP 165B-169B	4	None	stable	25	stable	12
TOTAL:	102					285
Turkey						
MP 95B-108B	13	None	stable	2,000	increasing	50
MP 127B-168B	41	None	stable	800	increasing	148
TOTAL:	54					198

TABLE 2-26 (Concluded)
WILDLIFE SPECIES AND HABITATS AFFECTED BY THE SAN AGUSTIN ALTERNATIVE (B)

Wildlife Species	Miles of Occupied Habitat	Crucial Habitats	Habitat Trends[1]	Population Estimate	Population Trend	Acres of Temporarily Removed[2]
Quail						
MP 0B-81B	81		stable	not calculated	stable	221

SOURCE: Based on the wildlife distribution, population estimates, and habitat classifications on computerized maps furnished by the Technology Application Center, University of New Mexico, using data from the New Mexico Department of Game and Fish (current as of July 1982).

[1]The numbers in parentheses are judgmental ratings from the New Mexico Department of Game and Fish of the quality of the occupied habitat ranging from 1 to 10 (1 = the lowest possible quality; 10 = the highest).

[2]These are areas of habitat that would be temporarily disturbed and then revegetated. Revegetation is expected to be complete in 3 to 5 years.

AFFECTED ENVIRONMENT

The Gila National Forest Land Management Plan is nearing completion and the draft EIS is planned for public release in March 1985. Representatives from major utility companies that would require utility corridors through the Gila National Forest were asked to identify any future needs. Because no utility corridors would be needed in this area through the 1980s and 1990s, the plan does not consider expanding existing utility corridors or creating new ones.

The San Agustin Alternative would cross 29.4 miles of the Gila National Forest in an area with no utility corridor designation.

IMPACTS

The San Agustin Alternative would conflict with the draft Gila National Forest Land Management Plan by crossing an area not designated for utility corridors. Designation of a new corridor would conflict with visual management goals, management costs, and wildlife protection efforts not presently considered in the plan. Prescribed burning carried out by the Forest Service in the vicinity would need to be more intensively managed to assure transmission line and worker safety.

GILA ALTERNATIVE (C)

Electromagnetic Interference

AFFECTED ENVIRONMENT

The affected environment for the Gila Alternative would be similar to that described for the Proposed Action. The alternative would be located at least 50 miles from any existing or planned VLA site and 40 miles from the future VLBA site.

IMPACTS

The Gila Alternative would place the transmission line more than 40 miles from the end of the southwest arm of the existing VLA or the future VLA extension. At this distance, no measurable significant electromagnetic interference with the VLA or future VLA extension would occur.

Visual Resources

AFFECTED ENVIRONMENT

The Gila Alternative would cross both physiographic provinces described for the Proposed Action: the Basin and Range and the Colorado Plateaus (Fenneman 1931), changing at about MP 130C. Cultural modifications visible in the landscape along the route include highways, local roads, a railroad, rural communities, ranch headquarters, other small residences, utilities, and two TEPC transmission lines. The alternative route would parallel these lines between MP 104C and 173C.

The landscape in three of the five VRM classes would be affected by the alternative, as would the two VQOs of Partial Retention and Modification on National Forest lands. The Gila Alternative would cross 43.5 miles of VRM Class II areas, generally occurring along U.S. Highway 180 between Silver City and the Gila National Forest boundary; 34.5 miles of Class III areas, northwest of Deming to Whitewater; and 29.5 miles of Class IV areas including those areas outside National Forest land not classified otherwise (BLM 1982, 1983a).

Within the Gila National Forest and the State of New Mexico portion of the Apache National Forests the alternative would cross 38 miles of VQO Partial Retention areas located in foreground areas along U.S. Highway 180 including views from the Aldo Leopold Vista and the San Francisco River. The alternative would cross another 27.5 miles of VQO Modification areas, which are generally not seen or are seen in the background from U.S. Highway 180 and the San Francisco River (FS 1984a). Table 2-27 summarizes the existing areas, by milepost, that would be crossed by the alternative route.

TABLE 2-27
TOTAL MILES OF VISUAL RESOURCE MANAGEMENT CLASSES AND VISUAL QUALITY OBJECTIVES AFFECTED BY THE GILA ALTERNATIVE (C)

Milepost	Number of Miles	Class II	Class III	Class IV	VQO Partial Retention	VQO Modification
0.0–4.0C	4.0		4.0			
4.0–6.0C	2.0	2.0				
6.0–30.5C	24.5		24.5			
30.5–40.0C	9.5			9.5		
40.0–68.0C	28.0	28.0				
68.0–70.0C	2.0			2.0		
70.0–76.5C	6.5	6.5				
76.5–78.0C	1.5			1.5		
78.0–80.0C	2.0	2.0				
80.0–84.0C	4.0			4.0		
84.0–87.0C	3.0	3.0				
87.0–88.0C	1.0			1.0		
88.0–90.0C	2.0	2.0				
90.0–101.0C	11.0				11.0	
101.0–112.0C	11.0					11.0
112.0–139.0C	27.0				27.0	
139.0–155.5C	16.5					16.5
155.5–161.0C	5.5			5.5		
161.0–167.0C	6.0		6.0			
167.0–173.0C (End)	6.0			6.0		
TOTAL:	173.0	43.5	34.5	29.5	38.0	27.5

Refer to Appendix 5, Visual Resources Management Methodologies, for definitions of terms.

IMPACTS

The impacts from this alternative are described in Table 2–28. The Gila Alternative would significantly affect 43.5 miles of VRM Class II areas, 34.5 miles of Class III areas, and 7.5 miles of VQO Partial Retention areas.

Significant adverse visual resource impacts would result from placing the transmission line on the natural-appearing landscape. The transmission line would be visible from the Aldo Leopold Vista. A transmission line constructed within view of the vista would create a significant adverse impact to the viewers. Generally, the modifications would not meet the standards of the VRM class or VQO for the areas where the project would be located and viewed by the public.

The cumulative effects of placing the Gila Alternative transmission line alongside the two existing TEPC transmission lines cannot be determined. Although it appears that an additional transmission line could be placed on the landscape, another line could be completely unacceptable to the viewing public. It is also possible that construction of another line would negate much of the mitigation completed during construction of the two existing lines. Design and construction of the lines included vegetation clearing and feathering that blended with the surrounding vegetation, careful placement of towers to take advantage of topographic and vegetative screening and lessen clearing widths, and other similar techniques. Successful placement of a third line may not be as feasible, because of limited opportunities or inability for sensitive placement. Also, the two existing lines may already be visually unacceptable to some of the viewing public.

Portions of all three lines would be visible from the Blue Range Wilderness, U.S. Highway 180, and from local communities and other local roads. Those points from where the lines would be seen and where long-term, adverse significant impacts would be fairly certain to occur are listed in Table 2–28. Significant impacts are summarized for the following areas of concern: 46 miles viewed from U.S. Highway 180 and local communities. The impacts from where the route crossed U.S. Highway 60 would likely be insignificant since accepted design techniques for tower construction and project alignment across a highway were used. Impacts along the remainder of the route would be insignificant.

Cultural Resources

AFFECTED ENVIRONMENT

See the Proposed Action for a review of the cultural resources. From MP 106C to 173C, the Gila Alternative would follow the TEPC San Juan to Vail, 345 kV transmission line. Fuller (1980) summarizes the cultural resources and the inventory work done in 1972 for this transmission line route.

The area along the Gila Alternative route is mountainous to the north, falling off into foothills, and finally into basin and range toward the south. In the 1930s and 1940s, the northern portion of the route received attention from archaeologists who concentrated on excavating sites believed to be typical. However, little broad-based or systematic inventory was done in the area during the time of the study.

Over 124 known cultural sites have been identified within a 1-mile-wide corridor of the Gila Alternative route. These sites include unidentified lithic scatters or campsites that may relate to Paleo-Indian or Archaic occupations or to any of the more recent Indian occupations. Seventeen sites are Mimbres-Mogollon. The alternative would cross the historic El Paso and Fort Yuma route (MP 17C), which often follows the Overland mail route. The route would also intersect the Cooke's wagon road (Mormon Battalion) at MP 18C and Butterfield Trail at MP 19C. Six sites are associated with the Historic period.

Classes of sites that may be determined eligible for listing on the National Register of Historic places include the Mogollon, Paleo-Indian, Archaic, Animas, and Salado.

Areas of high site probability can be found between MP 59C and 71C and between MP 101C and 165C.

IMPACTS

Impacts from the Gila Alternative would be similar to those identified in the Proposed Action discussion.

Wilderness

AFFECTED ENVIRONMENT

The Gila Alternative route would be located 5 miles or less from three Forest Service-administered wilderness units: the Gila Wilderness, the Blue Range Wilderness, and the San Francisco WSA.

Gila Wilderness (Map 1–2). The Gila Wilderness became the Forest Service's first administratively managed wilderness in 1924. The passage of the Wilderness Act of 1964 (Public Law 88–577) provided formal protection for the Gila Wilderness. In December 1980, the New Mexico Wilderness Act (Public Law

TABLE 2-28
SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS CAUSED BY THE GILA ALTERNATIVE (C)[1]

Milepost	Number of Miles	Existing VRM Class[2]	Primary Viewpoints and Description of Impacts[3]
0-5.5C	1.5 4.0	II III	Viewed from U.S. Highway 180, local roads and rural residences as fg/mg. Contrasts in form and line elements with existing landscape would add to cumulative impacts of scale dominance. Skylighted.
40-52C	12.0	II	Viewed from U.S. Highway 180, State Highway 90, and rural residences as fg/mg. Transmission line elements of form and line would be a dominant feature in terms of scale in a natural appearing landscape.
59-77C	16.0 2.0	III IV	Viewed from U.S. Highway 180, communities of mangus Springs and Riverside, ranch and other rural residences, and potential candidate river for designation as wild and scenic River (Gila River) as fg/mg. Scale of towers and conductors would dominate landscape. Portions skylighted.
84-87C	3.0	III	Viewed from U.S. Highway 180 and State Highway 78 as fg/mg. Facility elements of form and line would dominat natural-appearing landscape in terms of scale. Portions skylighted.
88.5-93.5C	5.0	PR	Viewed from U.S. Highway 180 and Aldo Leopold Vista as mg. Form and line elements would dominate the natural-appearing landscape within Gila National Forest.
94-97C	3.0	PR	Viewed from U.S. Highway 180 and potential candidate river for designation as wild and scenic river (San Francisco River) as fg/mg. Scale of towers and conductors would dominate landscape within Gila National Forest. Portions skylighted.
119-120C	1.0	PR	Viewed from U.S. Highway 180 as fg/mg. Facility elements, would add to cumulative impacts of scale dominance with existing transmission lines.
122-123C	1.0	PR	Viewed from U.S. Highway 180 north of Saliz Pass as fg/mg. Facility element would add to cumulative impacts of scale dominance with existing transmission lines skylighted.

TABLE 2-28 (Concluded)
SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS CAUSED BY THE GILA ALTERNATIVE (C)[1]

Milepost	Number of Miles	Existing VRM Class[2]	Primary Viewpoints and Description of Impacts[3]
128-129C	1.0	PR	Viewed from State Highway 12 as mg and Bg. Facility elements would add to cumulative impacts of scale dominance with existing lines.
130.5-131C	0.5	PR	Viewed from U.S. Highway 180 as fg where route would cross highway. Facility elements would add to cumulative impacts of scale dominance with existing transmission lines (skylighted).

[1] All visual resource impacts would be caused by adding transmission towers and conductors to the landscape, unless otherwise noted.

[2] Refer to Appendix 5, Visual Resource Management Methodologies, for definitions of terms.

[3] All impacts would last for the life of the project—until the transmission line is removed.

Distance Zones: fg = foreground; mg = middleground; bg = background; fg/mg = foreground/middleground.

96-550) expanded the boundaries of the Gila Wilderness to its current 558,065 acres. The wilderness is noted for its high scenic qualities, natural values, and varied recreation opportunities. The Gila Alternative route would pass west of U.S. Highway 180. At its closest point (MP 95C), the Gila Alternative would pass 5 miles west of the Gila Wilderness. Portions of the transmission line could be viewed from the wilderness but would not be evident to the casual viewer.

Blue Range Wilderness (Map 1-2). The 29,304-acre Blue Range unit was designated as a wilderness with the passage of the New Mexico Wilderness Act in 1980. Its eastern boundary lies 300 feet from the center line of the western-most line of the two existing TEPC transmission lines. The wilderness is mountainous with highly scenic and natural values. The Gila Alternative route would parallel the two existing TEPC transmission lines along the eastern edge of the wilderness area boundary and pass 500 feet east of the wilderness boundary between MP 116C and 126C. Portions of the alternative transmission line would be plainly visible along with the two existing lines from the wilderness, especially near its eastern boundary and at higher points within the unit.

San Francisco WSA (Map 1-2). The primary resource values of the 8,000-acre San Francisco WSA, which straddles the San Francisco River, include undisturbed riparian, mixed conifer, and forest vegetation; wildlife; and solitude. The area was designated as a WSA with the passage of the New Mexico Wilderness Act in 1980. The Forest Service is required to complete its studies on whether to recommend the area for wilderness designation by 1986. The Gila Alternative would pass a half mile northeast of the WSA at MP 95C. Portions of the transmission line might be seen by WSA users looking at the area where the line would cross the river gorge, upriver from the WSA.

IMPACTS

No significant, direct impacts to the wilderness resource are anticipated since the alternative transmission line would not cross any wilderness unit boundaries.

Gila Wilderness. The alternative route, passing to the west of U.S. Highway 180, would not affect the naturalness or solitude of the Gila Wilderness. The transmission line would lie an average of 10 miles from

the wilderness with the closest point being 5 miles distant (MP 95C). Because of the distance of the alternative from the wilderness and because several other developments presently occur outside the wilderness boundary (including U.S. Highway 180, range fencing, telephone lines, and housing), an additional transmission line would not impair any visual qualities. However, the project could contribute to the cumulative impacts visible outside the unit. This additional impact would be long term but considered insignificant by most observers. Landscape elements are diverse in the area where the project would be located and because of the distance, the transmission line would be difficult to view by the casual observer.

Blue Range Wilderness. Because the Gila Alternative would parallel two existing TEPC transmission lines, it would tend to add to the already existing visual conditions. Landform and vegetation would screen portions of the transmission line from most viewers from within the area, as would the distance of the alternative from the wilderness. However, in other areas near the eastern boundary of the unit and from higher vantage points within the unit, the line would be visible. Cumulatively, the significance of the impact would depend of the individual user's perspective and viewpoint. Although the Forest Service does not manage lands along the periphery of the wilderness as a buffer from outside sights and sounds, visitors to the wilderness would be distracted from the scenic quality of the area because of the cumulative effects of three transmission lines.

San Francisco WSA. The primary wilderness values of this WSA lie downstream from where the alternative route would cross the San Francisco River (MP 95C). Since the San Francisco River meanders through the canyon, the transmission line could be visible at specific points. However, in other instances, the transmission line would not be seen by visitors because of landform and vegetative screening. Since the unit is visually pristine, views of the transmission line may lessen the natural qualities and solitude experiences in portions of the WSA. However, the significance would depend on the user's perspective and viewpoint.

Recreation Resources

AFFECTED ENVIRONMENT

The Gila Alternative would follow two existing TEPC transmission lines between MP 120C and 173C and would cross the Gila National Forest and the State of New Mexico Portion of the Apache National Forest. Between MP 0C and 131C, the Gila Alternative would also parallel U.S. Highway 180, which is used extensively for sightseeing. The Gila Alternative route would bypass the Aldo Leopold Vista, 1 mile west of U.S. Highway 180 at MP 90C (Map 1-2). The vista is a popular stopping place for the traveling public to view scenic attractions to the east, north, and west. Interpretive signs assist visitors in understanding and identifying the major topographic features of a nearly natural-appearing landscape. Recreation opportunities include fishing, campgrounds (Cottonwood and Pueblo Creek), a hot spring, and rock hounding. The Gila Alternative would cross the CDNST planning corridor near the origin of the route (MP 0C).

From the San Carlos Reservoir in Arizona, upstream to the confluence of its east and west forks (255 miles) in New Mexico, the Gila River was identified as a potential candidate for wild and scenic river designation (NPS 1982). The alternative route would cross a candidate portion of the Gila River at MP 70C, west of Cliff, New Mexico.

The San Francisco River, from its crossing of the New Mexico-Arizona state line, southwest of Glenwood, New Mexico, upstream to Luna Lake (near Alpine, Arizona), a total of 117 miles, was also identified as a potential candidate for wild and scenic river designation (NPS 1982). ***The San Francisco River Wild and Scenic River Study Report and Environmental Statement*** (FS 1981b) recommended that 29 miles of the river in Arizona be considered ineligible for wild and scenic designation. However, the portion of the river in New Mexico has not been studied. The alternative route would cross the San Francisco River twice at MP 95.2C and MP 139C.

IMPACTS

The Gila Alternative would significantly affect the recreation resources in the area. Although the alternative would parallel two TEPC transmission lines in the Gila National Forest and the State of New Mexico portion of the Apache National Forests, the cumulative effect upon the scenic quality may not be acceptable. Travelers along U.S. Highway 180; visitors to the Blue Range Wilderness, San Franciso WSA, Cottonwood and Pueblo Creek campgrounds, and the Aldo Leopold Vista; and residents of local communities would probably notice the transmission lines, thereby diminishing the quality of their recreational experiences. See the Visual Resource and Wilderness sections for more discussion.

Solitude experiences and scenic and natural qualities within the Blue Range Wilderness and the San Francisco WSA would most likely be affected.

For 2 to 3 months, sightseers traveling along U.S. Highway 180 or wilderness visitors near the eastern portion of the Blue Range Wilderness may be affected by some noise and dust during construction. Noise and dust could also affect visitors at the Aldo Leopold Vista and the San Francisco WSA during project construction.

The Gila Alternative would not significantly affect recreational opportunities as experienced by hikers using the CDNST planning corridor, but users of the Gila and San Franciso Rivers would be able to view the alternative transmission line, which would be a significant impact.

Soils and Vegetation

AFFECTED ENVIRONMENT

The Gila Alternative route would cross 34 miles of MLRA 42, 80 miles of MLRA 36, and 59 miles of MLRA 39. A large portion of the route would cross steep and very steep mountainous and foothill terrain.

Soils. The following generalized groups of soils would be affected by transmission line construction. (A brief description of the generalized soil groups is provided in Appendix 7.)

- Soils of the mountains and mountain valleys (16 to 25 inches average annual precipitation).
- Soils of the foothills (11 to 16 inches average annual precipitation).
- Soils of the nearly level to gently sloping broad basin floors and valley bottoms (8 to 11 inches average annual precipitation).
- Soils of the gently sloping to strongly sloping alluvial fans and terraces dissected by intermittent drainageways and arroyos, including rough broken land (11 to 16 inches average annual precipitation).
- Sandy soils on nearly level to undulating to gently rolling broad valley floors, commonly including coppice dunes forming in and around mesquite and other shrubs (8 to 10 inches average annual precipitation).

Revegetation potential and erosion control needs for the soils affected would be similiar to those along the Proposed Action route. The location and extent of the larger areas of unfavorable soils and terrain are identified in Table 2-29.

TABLE 2-29
AREAS REQUIRING MORE INTENSIVE RECLAMATION AND EROSION CONTROL: GILA ALTERNATIVE (C)

Location By Milepost	SENSITIVE AREA DESCRIPTION AND COMMENTS			
	Extent Miles (Acres)	Slopes (15% +)	Unfavorable Soils Properties*	Other
0.0–0.5C	0.5		X	Sandy Soils, (Coppice Dunes)
30.2–30.9C	0.7	X	X	
33.0–33.2C	0.2	X	X	
36.4–36.6C	0.2	X	X	
40.7–41.0C	0.3	X	X	
43.5–43.8C	0.3	X	X	
47.5–48.0C	0.5	X	X	
48.2–48.8C	0.6	X	X	
64.7–65.5C	0.8	X	X	
76.4–76.7C	0.3	X		
77.0–77.2C	0.2	X	X	
78.3–79.0C	0.7	X	X	
81.3–81.9C	0.6	X	X	
88.4–88.8C	0.3	X	X	

TABLE 2-29 (Concluded)
AREAS REQUIRING MORE INTENSIVE RECLAMATION AND EROSION CONTROL: GILA ALTERNATIVE (C)

Location By Milepost	SENSITIVE AREA DESCRIPTION AND COMMENTS			
	Extent Miles (Acres)	Slopes (15% +)	Unfavorable Soils Properties*	Other
90.1-91.4C	0.3	X	X	
92.0-92.4C	0.4	X	X	Mtn. Sideslope Hard Rock, Very Steep
95.0-95.3C	0.3	X	X	Mtn. Sideslope Hard Rock, Very Steep
96.0-96.3C	0.3	X	X	Mtn. Sideslope Hard Rock, Very Steep
98.2-99.0C	0.8	X	X	Mtn. Sideslope
99.6-100.1C	0.4	X	X	Mtn. Sideslope
102.1-102.6C	0.5	X	X	Mtn. Sideslope
104.7-105.5C	0.8	X	X	Mtn. Sideslope Hard Rock
105.8-106.7C	0.9	X	X	Mtn. Sideslope Hard Rock, Very Steep
107.1-107.3C	0.2	X	X	Mtn. Sideslope
108.4-108.7C	0.3	X	X	Mtn. Sideslope
18.4-118.7C	0.3	X	X	Mtn. Sideslope
120.1-123.7C	3.6	X	X	Mtn. Sideslope
124.5-126.1C	0.6	X	X	Mtn. Sideslope
126.6-127.9C	1.3	X	X	Mtn. Sideslope
132.1-133.3C	1.2	X	X	Mtn. Sideslope
134.2-135.1C	0.9	X	X	Mtn. Sideslope
135.5-139.7C	4.2	X	X	Mtn. Sideslope
142.3-144.4C	2.1	X	X	Mtn. Sideslope
145.4-146.0C	0.6	X	X	Mtn. Sideslope
150.4-151.7C	1.3	X	X	Mtn. Sideslope
161.4-161.6C	0.2	X	X	Ridge
164.2-164.8C	0.6		X	Playa Lake
166.5-166.9C	0.4	X		
169.1-169.4C	0.3	X	X	
TOTAL:	29.3 (88)			

Note: Table prepared from soils-terrain analysis and orthophotograph interpretations. Milepost locations are approximate, based on general, preliminary right-of-way information.

*Unfavorable soil property parameters:
— shallow over bedrock
— underlain by hard bedrock
— sandy loam sand and clay textured surface and subsoil layers
— containing more than 35 percent coarse fragments by volume, exceeding sizes of 3 inches in diameter
— permeability less than 0.6 inch per hour
— water table less than 72 inches below surface
— soil reaction with pH value greater than 8.5, salinity more than 16 millimhos in the upper 40 inches
These soils will require more intensive reclamation and erosion control.

Vegetation. The Gila Alternative would affect the following major vegetation types: riparian, pseudo-riparian, pinyon-juniper, mixed conifer, mountain shrub, mountain meadow, mesquite-grass and mesquite-dunal, yucca-grassland, and grassland. See Table 2-30 for miles of vegetation types crossed and Appendix 7 for a brief description of the major vegetation types, their use, importance, and revegetation potential.

IMPACTS

The Gila Alternative would disturb 464 acres, all of which would be rehabilitated. Types of land disturbances would be similar to those described for the Proposed Action.

The Gila Alternative would cross 29.3 miles of sensitive soil and terrain. These areas are sensitive because they contain less favorable soil, slope, and climatic conditions; are more susceptible to erosion hazards; and have a lower revegetation potential. See Table 2-29 for the location and size of sensitive soil areas. Soil impact potential would be similar to that along the Proposed Action route.

Impacts to vegetation would generally be insignificant. Understory vegetation is expected to return to near-preconstruction conditions within 5 years after construction using the erosion control, reclamation, and revegetation program outlined in Appendix 2. Overstory vegetation (trees and shrubs) would take longer to become established but generally only small areas (at tower sites and beneath the lines) of overstory vegetation would be disturbed. Larger areas of disturbance may be required in steeper terrain.

Table 2-30 shows the estimated acreages of each major vegetation type that would be disturbed by construction and installation of the transmission line. See the Proposed Action section for a discussion of vegetation impacts.

TABLE 2-30
VEGETATION TYPES AFFECTED AND DISTURBED BY THE GILA ALTERNATIVE (C)

Vegetation Type	Miles Crossed	Acres Disturbed
Riparian	1.7	5
Pseudoriparian	2.8	8
Pinyon-Juniper	15.3	45
Mixed Conifer	29.7	89
Mountain Meadow	3.5	11
Mountain Shrub[1]	7.7	83
Creosote Bush	0.0	0
Mesquite-Grassland	3.1	9
Mesquite-Dunal	0.2	1
Sagebrush-Grassland	0.0	0
Yucca-Grassland	13.2	40
Grassland[2]	75.8	173
TOTAL:	173.0	464

Refer to Appendix 7 for source of data and description of vegetation types. All disturbed land will be reclaimed.

[1] A total of 40 acres of mountain shrub occur in MLRA 36 and 43 acres occur in MLRA 39.

[2] A total of 43 acres of grassland occur in MLRA 42, 112 acres in MLRA 36, and 18 acres in MLRA 39.

Overstory vegetation (mainly trees) would be permanently removed to allow access and provide safe transmission line operation. The disturbed areas would be small and generally insignificant, except in areas with steep slopes and in the forested areas (mixed conifer vegetation type) where timber is marketable. See the Forest Management section for discussion of long-term timber harvest conflicts.

Livestock Grazing

AFFECTED ENVIRONMENT

The ranching operations and grazing capacities of lands along the Gila Alternative route be similar to those along the Proposed Action route. The alternative would cross 89 acres of forest land that is used for livestock grazing. Table 2-31 identifies the number of ranch

TABLE 2-31
DISTANCE OF THE GILA ALTERNATIVE (C)
FROM RANCH HEADQUARTERS, DWELLINGS, AND
LIVESTOCK WATERING FACILITIES[1]

Location by Milepost	Distance to Ranch Headquarters and Dwellings (Ft)[2]	Distance to Livestock Watering Facilities (Ft)[3]	Additional Notes
2.2C	0–250*		Peru Hill
11.3C	250–500*		
18.2C	0–250*	250–500	
18.4C			Landing Strip 250–500 feet
37.3C	0–250*		
42.1C	0–250*		
42.2C		250–500	
55.2C		0–250*	Two Windmills
62.4C		0–250*	Pond
68.3C		0–250*	
73.6C		0–250*	Windmill
82.1C		250–500*	
84.4C	0–250*		
92.8C		250–500*	Tank
99.1C		250–500*	Tank
104.6C		0–250*	Tank
105.6C		0–250*	Tank
106.7C		500–1000	Spring and Tank
107.3C		500–1,000	Tank
115.0C	0–250*		Tank
117.5C		500–1,000	Tank
140.8C			Spring
146.9C		500–1,000	Lake
152.4C		0–250*	Tank
158.4C		250–500	Laguna Verde

SOURCE: Locations of ranch headquarters, dwellings, and watering facilities recorded from the latest U.S. Geological Survey topographic maps, scale 1:24,000, supplemented with BLM and local land status maps.

* Facilities occurring within the 250-foot distance of concern.

[1] Includes ranch headquarters, dwellings, and livestock watering facilities within 1,000 feet of the transmission line.

[2] Includes livestock watering facilities when associated with the ranch headquarters and dwellings.

[3] Includes livestock watering facilities (tank, pond, and windmill) not associated with ranch headquarters.

headquarters, dwellings, and livestock watering facilities near the transmission line.

IMPACTS

The Gila Alternative route would cause a short-term (1- to 5-year) annual loss of 60 AUMs of forage on 464 acres spread along 173 miles. Types of land disturbance would be the same as described for the Proposed Action.

Forage lost by transmission line construction would be well below the 1 percent significance criterion and therefore considered insignificant. The invasion of poisonous and invader plants on disturbed areas would also be insignificant. The transmission line would cross within 250 feet of five ranch headquarters and dwellings and nine livestock watering facilities.

See the Proposed Action section for discussion of land disturbance, forage loss, and the effects of transmission line operation.

Socioeconomics

AFFECTED ENVIRONMENT

The socioeconomic area of influence for the Gila Alternative includes different counties and communities from those of the Proposed Action and the other alternatives. The following communities and counties are included in the area of influence for the analysis of population, employment, and per capita personal income impacts:

- Alpine and Springerville-Eagar, Apache County, Arizona;
- Reserve, Catron County, New Mexico;
- Bayard, Central, Hurley, and Silver City, Grant County, New Mexico; and
- Deming, Luna County, New Mexico.

See Appendix 8 for a description of the gravity model used to determine the area of influence.

The area of influence for revenue analysis includes the following counties and school districts, all in New Mexico:

- Catron County
- Quemado School District
- Reserve School District
- Grant County
- Cobre Consolidated School District
- Silver City School District
- Luna County
- Deming School District

IMPACTS

Construction. Construction of the Gila Alternative would not cause any significant impacts. See Tables 2–32 and 2–33 for data relating to population, employment, per capita personal income, and local government revenue. Between 1986 and 1987, population growth is expected to range from 4 percent in Reserve to less than 1 percent in Bayard, Central, Hurley, and Deming. Total employment growth would vary from 2 percent in Catron and Grant counties to less than 1 percent in Apache County. The per capita personal income increase would vary from 3 percent in Catron County to 1 percent in Apache and Luna counties. Local government revenue would rise less than 1 percent in all jurisdictions. All of these impacts fall below the 10 percent significance criteria. As a result, the effects on housing, public services and facilities, and social conditions in the area of influence would also be insignificant.

The livestock grazing industry would incur insignificant losses as a result of transmission line construction. (See Livestock Grazing section for additional discussion.) Short-term timber production would not be affected by construction because the timber salvaged from the right-of-way would be counted as part of that year's allowable cut. (See Gila Alternative, Forest Management section, for discussion of long-term timber harvest conflicts.) No other local industry sector would be affected by construction.

Operation. Impacts to population, employment, and per capita personal income from transmission line operation would be the same as from the Proposed Action. Impacts to local government revenue (Table 2–33) would be insignificant, varying from 2 percent in Catron County to less than 1 percent in the other jurisdictions—all well below the 10 percent significance criteria. Losses to the livestock grazing industry would be insignificant.

Transportation Networks

AFFECTED ENVIRONMENT

The area of influence for the Gila Alternative includes roadway segments of U.S. Highways 180 and 60 and

TABLE 2-32
IMPACTS TO POPULATION, EMPLOYMENT, AND PER CAPITA INCOME FROM CONSTRUCTION OF THE GILA ALTERNATIVE (C)

County and Community	Baseline	Increase over Baseline	Percentage Increase over Baseline
Population			
Apache County	62,500	160	N/A*
Alpine	580	20	3.4
Springerville-Eagar	5,920	80	1.4
Catron County	2,900	20	N/A*
Reserve	490	20	4.1
Grant County	30,300	160	N/A*
Bayard	3,620	20	0.6
Central	2,350	10	0.4
Hurley	1,930	10	0.5
Silver City	11,780	120	1.0
Luna County	16,700	40	N/A*
Deming	10,830	40	0.4
Total Employment			
Apache County	18,000	140	0.8
Catron County	900	20	2.2
Grant County	11,200	230	2.1
Luna County	4,900	50	1.0
Per Capita Personal Income			
Apache County	$5,948	$6,005	1.0
Catron County	6,230	6,406	2.8
Grant County	8,710	8,883	2.0
Luna County	7,835	7,911	1.0

See Appendix 8 for data sources and analysis methods.

*N/A = not applicable; the significance of population increase is measured for communities because they have to provide the facilities and services.

TABLE 2-33
IMPACTS TO LOCAL GOVERNMENT REVENUE
FROM CONSTRUCTION AND OPERATION OF THE GILA ALTERNATIVE (C)

County and School District	Baseline Revenue*	Revenue Increase over Baseline*	Percentage Increase over Baseline
Construction (1986-1987)			
Catron County	$1,398	$ 2	0.1
Quemado School District	1,116	0	0.0
Reserve School District	1,525	1	0.1
Grant County	3,225	2	**
Cobre Consolidated School District	6,083	1	**
Silver City School District	16,681	0	0.0
Luna County	2,927	1	**
Deming School District	9,022	1	**
Operation (1990)			
Catron County	$1,527	$32	2.1
Quemado School District	1,253	1	0.1
Reserve School District	1,713	10	0.6
Grant County	4,426	23	0.5
Cobre Consolidated School District	6,317	6	0.1
Silver City School District	17,625	1	**
Luna County	3,013	17	0.6
Deming School District	9,285	9	0.1

See Appendix 8 for data sources and analysis methods.

*Figures are given in thousands of dollars.

**Less than $500 or 0.05 percent.

Bill Knight Gap Road, which are located in Catron, Grant, and Luna counties, New Mexico, and Apache County, Arizona. These roads are primarily used for local traffic with some long-distance, through traffic. The route would cross the Gila National Forest between MP 90C to 156C (Map 1-2).

The transportation analysis for the Gila Alternative includes two major, paved roads: U.S. Highways 180 and 60, which would be used to transport material, equipment, and labor force to the construction site. In addition to the major roads, various Forest Service gravel roads and private primitive dirt roads would provide access off the major roads to the transmission line right-of-way.

IMPACTS

The Gila Alternative would increase traffic volume on U.S. Highway 180 between Deming, New Mexico and Alpine, Arizona; between the junction of U.S. 180 and the Bill Knight Gap Road; and the junction of U.S. Highway 60. The project roadway segments of U.S. Highway 60 between Springerville, Arizona and its junc-

tion with Bill Knight Gap Road would be able to sustain the traffic volume increase without lowering the level-of-service. However, segments of U.S. Highway 180 and Bill Knight Gap Road would have an unstable downstream traffic flow occurring at the end of each working day. This would be a significant impact based on the significance criterion.

Increased project-related traffic during construction would result in increased accidents, particularly at junctions and intersections along roadway segments of U.S. Highway 180 and Bill Knight Gap Road. Increased project-related traffic on roadway segments of U.S. Highway 180 (from Deming, New Mexico to Alpine, Arizona) and Bill Knight Gap Road (from Luna to U.S. Highway 60) would increase accidents by 7.2 per year; 4.4 of these accidents could occur at intersections or junctions as shown on Table 2-34. The increase in traffic accidents exceeds the significance criterion that states that any increase in accidents would be significant. The traffic accident impact would be short term—during the construction period.

TABLE 2-34
TRAFFIC ACCIDENT DATA: BASELINE 1986 AND PROJECTED INCREASES FROM THE GILA ALTERNATIVE (C)

Roadway Segments	Total Miles of Roadway Segments	AVERAGE DAILY TRAFFIC		TOTAL ACCIDENTS		Projected Increased Accidents	Percent of Accidents at Junctions 1986	Projected Accidents at Junctions
		1986	Projected	1986	Projected			
U.S. Highway 180, between Interstate 10 (Deming) and Junction of State Highway 211 to Gila	43	2,998	3,102	81	83.8	2.8	54	1.5
U.S. 180 between New Mexico State Highway 211 and Cliff to Arizona state line	89	502	662	18	22.4	4.4	66	2.9
U.S. Highway 60 between Arizona state line and Bill Knight Gap Road Junction	10	696	727	3	3	0.0	0	0.0
TOTAL:	142	N/A	N/A	102	109.2	7.2	N/A	4.4

SOURCE: New Mexico State Highway Commission 1983.

NOTE: Projected baseline calculated on the basis of a 1.5 percent annual population increase; N/A = Not Applicable. No traffic data available for Bill Knight Gap Road (secondary gravelled roadway).

Terrestrial Wildlife

AFFECTED ENVIRONMENT

The Gila Alternative route would cross nine habitat (vegetation) types: riparian, pseudoriparian, pinyon-juniper, mixed conifer, mountain shrub, mesquite-grass, mesquite-dunal, yucca-grassland, and grassland. The Gila Alternative would affect species similar to those affected by the Proposed Action and would also affect elk and bighorn sheep. This alternative route would cross 133 miles of mule deer habitat, 32 miles of elk habitat,

59 miles of Coues whitetail deer habitat, 41 miles of pronghorn range, 131 miles of black bear habitat, 138 miles of javelina range, 4 miles of bighorn sheep range, 52 miles of turkey habitat, and 120 miles of quail habitat. (See Table 2-35 for wildlife species that would be affected by the alternative.)

TABLE 2-35
WILDLIFE SPECIES AND HABITATS AFFECTED BY THE GILA ALTERNATIVE (C)

Wildlife Species	Miles of Occupied Habitat	Crucial Habitats	Habitat Trends[1]	Population Estimate	Population Trend	Acres of Temporarily Removed[2]
Mule Deer						
MP 40C-77C	37	None	decreasing (4)	0.5 deer/Sec.	stable	110
MP 77C-93C	16	None	stable (8)	3 deer/Sec.	increasing	51
MP 93C-123C	30	Winter Range MP 95C-103C MP105C-112C	stable (8)	1 deer/Sec.	decreasing	82
MP 123C-149C	26	None	decreasing (4)	0.4 deer/Sec.	decreasing	52
MP 149C-173C	24	None	stable (5)	0.7 deer/Sec.	decreasing	48
TOTAL:	133					343
Elk						
MP 141X-173C	32	None	stable (5)	150	stable	64
Coves Whitetail Deer						
MP 45C-94C	49		stable	1,000	stable	148
MP 123C-133C	10		stable	1,000	stable	20
TOTAL:	59					168
Pronghorn						
MP 16C-44C	29	None	stable (7)	not calculated	increasing	87
MP 77C-89C	12	None	stable (5)	75	stable	36
TOTAL:	41					123
Black Bear						
MP 37C-168A	131	None	stable	50-750	stable	343
Javelina						
MP 0C-138C	138	None	stable	2,500	increasing	394
Bighorn Sheep						
MP 100C-104C	4	None	stable	200	increasing	16

TABLE 2-35 (Concluded)
WILDLIFE SPECIES AND HABITATS AFFECTED
BY THE GILA ALTERNATIVE (C)

Wildlife Species	Miles of Occupied Habitat	Crucial Habitats	Habitat Trends[1]	Population Estimate	Population Trend	Acres of Temporarily Removed[2]
Turkey						
MP 48C–57C	9		stable	100	stable	27
MP 98C–105C	7		stable	100	stable	26
MP 126C–162C	36		stable	800–1,500	increasing	72
TOTAL:	52					125
Quail						
MP 0C–120C	120		stable	not calculated	stable	358

SOURCE: Based on the wildlife distribution, population estimates, and habitat classifications on computerized maps furnished by the Technology Application Center, University of New Mexico, using data from the New Mexico Department of Game and Fish (current as of July 1982).

[1]The numbers in parentheses are judgmental ratings from the New Mexico Department of Game and Fish of the quality of the occupied habitat ranging from 1 to 10 (1 = the lowest possible quality; 10 = the highest).

[2]These are areas of habitat that would be temporarily disturbed and then revegetated. Revegetation is expected to be complete in 3 to 5 years.

IMPACTS

Table 2-35 lists the acres of habitat that would be disturbed by construction of this alternative. Generally, impacts from the Gila Alternative would be similar to those discussed for the Proposed Action.

Forest Management

AFFECTED ENVIRONMENT

The Gila Alternative would cross 64.1 miles of the Gila National Forest along an existing utilities corridor that is full. Although the draft Gila National Forest Land Management Plan includes the existing corridor, it does not include the concept of adding a new corridor to allow another transmission line. The plan also outlines specific timber harvest and visual management goals.

IMPACTS

The Gila Alternative would conflict with the draft Gila National Forest Land Management Plan because a new utility corridor would have to be added to allow another transmission line. In addition, the alternative would conflict with the timber harvest and visual management goals outlined in the draft Gila National Forest Land Management Plan. It would remove 220 acres of timber land from long-term production, between MP 98C and 102C and between MP 116C and 153C, because of vegetation clearing for towers and lines. Merchantable timber occurs in the mixed conifer type between the mileposts. Clearing of vegetation would reduce the allowable harvest by 25,000 board feet per year. Construction of the transmission line would also conflict with the Forest Service application of its Visual Management System. (See Gila Alternative, Visual Resources section, for more detail.) The Gila Alternative would not significantly alter the Forest Service goals for managing forage and wildlife habitat as a result of clearings for tower sites.

NO-ACTION ALTERNATIVE

Under the No-Action Alternative, BLM would deny a right-of-way to El Paso for the proposed or alternative routes. El Paso might not be able to find a feasible route avoiding BLM land where it could build a transmission line connecting TEPC's coal-fired generating plant near Springerville, Arizona with the El Paso system. If El Paso cannot find a route, it would not be able to meet its objective for oil and gas displacement (increased capacity to buy power on an interrupted basis) nor would it be able to increase the reliability of its system.

To meet system needs without adding transmission facilities, El Paso would have to continue generating power by using existing oil and gas-fired units for base load, thereby maintaining oil and gas consumption at or above present levels. El Paso estimates that the gas and oil used to generate this power would be three times more expensive than fuel-producing power from the Springerville source. Not only are oil and gas more expensive than coal as fuel sources for baseload generation, but the use of oil and gas as primary fuels by utility companies is discouraged by the Federal Energy Policy. Although present supplies of imported oil are plentiful, the future outlook is uncertain. El Paso's fuel costs have increased dramatically in the past 10 years—a dominant force behind rate increases.

El Paso could also offset the effects of the No-Action Alternative by increasing power purchases over the existing lines using interruptible capacity. However, the current transmission system operates at capacity whenever possible. Any increase in power brought into the system over existing facilities would greatly reduce the reliability of the whole system. Currently, if one of the transmission lines is lost, many customers have to be dropped from the system until local generation can pick up the load or until the transmission line can be restored to service. Adding more power to existing lines would decrease the stability of the system and make outages more frequent and severe.

CHAPTER 3

Benefits, Trade-Offs, and Commitment of Resources

CHAPTER 3

BENEFITS, TRADE-OFFS, AND COMMITMENT OF RESOURCES

Because the impact analysis in Chapter 2 considered the general measures stated in Appendix 2, no new mitigation measures were proposed or committed to, and thus the unavoidable adverse impacts for each resource have already been discussed. This chapter focuses only on the benefits, trade-offs, and the commitment of resources from construction and operation of the Proposed Action or alternative transmission line routes.

BENEFITS

The purpose of the Proposed Action and the three alternatives (Very Large Array, San Agustin, and Gila) is to interconnect the electrical transmission systems of the Tucson Electric Power Company with the El Paso Electric Company (El Paso) project to enable an electric energy transfer between the service areas of the companies. The interconnection would increase system reliability and diversify energy sources. Access to alternate energy sources could benefit El Paso's customers by lowering energy costs.

If the Proposed Action route was selected, annual property tax revenues for the affected counties would increase by $77,000. The Very Large Array Alternative would increase annual property tax revenues by $79,000; the San Agustin Alternative would increase annual property tax revenues by $95,000; and the Gila Alternative would increase annual property tax revenues by $99,000.

Construction of the Proposed Action or Very Large Array Alternative would generate opportunities for 250 workers, whereas the San Agustin Alternative would generate opportunities for 350 workers, and the Gila Alternative would generate opportunities for 440 workers. Workers would be employed during the 12-month construction period, with most workers coming from outside the area.

TRADE-OFFS

Neither the Proposed Action nor the alternatives would adversely affect local communities or the existing facilities of the Very Large Array. However, construction of the Proposed Action would adversely affect the future extension of the Very Large Array (1990s or later).

Project construction could affect 40 known cultural sites within a 1-mile-wide corridor of the Proposed Action and Very Large Array and San Agustin alternative routes. The construction of the Gila Alternative could affect 124 sites within a 1-mile-wide corridor. Construction would cause a small, short-term loss of wildlife habitat.

Scenic, semi-primitive recreation values along the western portion of the Horse Mountain Wilderness Study Area (WSA) and the northern portion of Continental Divide WSA would be adversely affected by construction of the Very Large Array and San Agustin alternatives. Scenic values would also be impaired at the Mesita Blanca WSA (Red Hill cinder cone) by construction of the Proposed Action and the Very Large Array and San Agustin alternatives.

Construction of the Proposed Action and the Very Large Array Alternative routes would significantly impair visual resources in the Plains of San Agustin. Construction of the Gila Alternative would visually impair the Aldo Leopold Vista and would impair visual resources by crossing public areas of concern, mainly along the U.S. Highway 180 viewing areas. Construction of the Gila Alternative would cause a small reduction in allowable timber harvest. Construction would

also generate more traffic, which could increase accidents. Construction would cause accelerated erosion, which would continue until erosion control measures were implemented. Understory vegetation lost on disturbed acres, however, would return to near preconstruction conditions within 5 years.

COMMITMENT OF RESOURCES

Construction and operation of the Proposed Action or any of the three alternatives could irreversibly or irretrievably commit certain environmental or energy resources. An irreversible commitment cannot be changed once it occurs; an irretrievable commitment means that a resource cannot be recovered or reused. Some resources may be adversely affected only for the short term.

Construction and operation of the Proposed Action or alternatives would irreversibly and irretrievably affect cultural resources and transportation networks for the life of the project. Table 3–1 summarizes the commitment of resources from construction and operation of the Proposed Action or alternatives.

TABLE 3–1
COMMITMENT OF RESOURCES FROM CONSTRUCTION AND OPERATION OF THE PROPOSED ACTION OR ALTERNATIVES

Resource	Irreversible Impacts	Irretrievable Impacts	Short-Term Impacts	Long-Term Impacts
Visual Resources	NO	NO	NO	YES
Cultural Resources	YES	YES	YES	YES
Wilderness	NO	NO	YES	YES
Recreation Resources	NO	NO	YES	YES
Soils	NO	NO	YES[1]	NO
Vegetation	NO	NO	YES[2]	NO
Livestock Grazing	NO	NO	YES[3]	NO
Socioeconomics	NO	NO	YES	YES
Timber Production	YES	NO	YES	YES
Air Quality	NO	NO	YES	NO
Terrestrial Wildlife	NO	NO	YES	NO

[1]Accelerated erosion would occur during construction and continue until erosion control measures were implemented.

[2]Understory vegetation is expected to return to near preconstruction conditions within 5 years.

[3]Forage production would be lost on disturbed land for two to five grazing seasons.

CHAPTER 4

Comparative Analysis

CHAPTER 4

COMPARATIVE ANALYSIS

The environmental impacts of the Proposed Action and the Very Large Array, San Agustin, and Gila alternatives are compared in this chapter. Numerical differences between the alternatives and the Proposed Action are shown in parentheses in Table 4–1. The comparative analysis was developed using information included in Chapter 2. Because impacts to federally listed threatened or endangered wildlife species, electromagnetic effects, cropland, paleontological resources, geological resources, and air quality from either the Proposed Action or the alternatives would be insignificant, these resources are not compared in this chapter. Moreover, Chapter 4 does not discuss or refer to the No-Action Alternative.

ELECTROMAGNETIC INTERFERENCE

Electromagnetic interference from the Proposed Action or the three alternatives would not reach harmful thresholds and would not cause any adverse effects on the present operations and facilities of the the Very Large Array. The Proposed Action would, however, adversely affect the future extension of the Very Large Array, planned for the 1990s or later. With the Proposed Action in place, the extension could not be built because the transmission line would cause electromagnetic interference that would greatly exceed the threshold level.

VISUAL RESOURCES

Visual resource impacts from the Proposed Action and alternatives are summarized by miles of significantly affected Visual Resource Management (VRM) classes and Visual Quality Objectives (VQOs) and miles crossing public areas of concern. Differences between miles that would be affected by the Proposed Action and by the alternatives are shown in parentheses.

Although the Proposed Action route would cross more miles through the Plains of San Agustin (and more VRM Class II) than the Very Large Array Alternative, the Proposed Action would cause fewer visual impacts to this area because the Proposed Action would use better placement among landforms to screen the transmission line from the road and ranch headquarters viewing points. The Very Large Array Alternative would cross the center of the Plains of San Agustin, where it would be visible for longer distances and longer viewing periods than the Proposed Action transmission line. The San Agustin Alternative would have little visual impact on the Plains of San Agustin.

The Gila Alternative would substantially impair visual resources along U.S. Highway 180 viewing areas, including the Blue Range Wilderness, the San Francisco WSA, and the Aldo Leopold Vista (46 miles within the Gila National Forest). The Proposed Action and other alternatives would impair visual resources along 2 miles of this highway. The San Agustin Alternative would substantially impair visual resources (27.5 miles) along the New Mexico State Highway 26 viewing areas. Although impacts at the U.S. Highway 60 crossing would not be significant due to design considerations incorporated into the project, the Proposed Action and the three alternatives would similarly affect the view from the highway.

CULTURAL RESOURCES

Land disturbance associated with construction of the Proposed Action and the Very Large Array and San Agustin alternatives could damage about 40 known cultural sites, but potential damage to known cultural

sites would be about three times greater under the Gila Alternative. The differences among the numbers of known sites along the Gila Alternative, other alternatives, and the Proposed Action are not necessarily representative; more inventory has been done along the Gila Alternative route. Since the exact location of the project facilities are unknown, specific impacts cannot be predicted. However, with extensive cultural inventory and compliance procedures as described in Appendix 2, impacts to cultural resources from the Proposed Action or alternatives should be insignificant.

SOILS AND VEGETATION

The Proposed Action would disturb 609 acres. The Very Large Array Alternative would disturb 36 acres more than the Proposed Action, the San Agustin Alternative would disturb 108 acres more than the Proposed Action, and the Gila Alternative would disturb 145 acres less than the Proposed Action. The Proposed Action and Gila Alternative routes would cross 29 miles of sensitive soils and terrain, whereas the Very Large Array and San Agustin Alternative would cross 8 more miles and 12 more miles, respectively.

Impacts to soils would be insignificant and therefore about the same for the Proposed Action and all alternatives. Soil and soil productivity and stability would be reduced by using the effective erosion control and reclamation measures outlined in Appendix 2. Disturbed land would thus be allowed to return to near-preconstruction conditions.

Impacts to vegetation would generally be insignificant because understory vegetation is expected to return to near-preconstruction conditions within 5 years after construction with the use of the erosion control, reclamation, and revegetation program outlined in Appendix 2. Therefore, understory vegetation impacts would not differ significantly between the Proposed Action and the alternatives, even with the variation in the acres disturbed. Trees and shrubs would take longer to revegetate than understory.

LIVESTOCK GRAZING

The short-term loss of 5, 12, or 6 animal unit months (AUMs) per year over the Proposed Action route would not be significant. Placing a tranmission line near ranch headquarters would cause some secondary impacts. The Very Large Array and San Agustin alternatives would pass within 250 feet of two ranch headquarters or dwellings, the Proposed Action route would pass within 250 feet of four ranch headquarters or dwellings, and the Gila Alternative route would pass within 250 feet of five ranch headquarters or dwellings. The Proposed Action and alternative routes would similarly affect livestock watering facilities—each route passing within 250 feet of 8 to 11 such facilities.

WILDERNESS

No direct impacts to wilderness values would occur from the Proposed Action or any of the alternatives. The Proposed Action transmission line would be viewed from the Mesita Blanca and Eagle Peak wilderness study areas (WSAs). The Very Large Array and San Agustin Alternative routes would be viewed from the Mesita Blanca, Eagle Peak, Horse Mountain and Continental Divide WSAs. The Very Large Array and San Agustin Alternative transmission lines would be in direct sight from the western boundary of the Horse Mountain WSA. The Very Large Array Alternative would be seen from the northern boundary of the Continental Divide WSA, and the San Agustin Alternative from its southern boundary. The Gila Alternative would be viewed from the San Francisco WSA and the eastern boundary of the Blue Range Wilderness even though it would parallel two existing transmission lines adjacent to the wilderness. The

significance of this impact can not be determined by this EIS as the significance is highly dependent on the individuals using the areas and their perspective and viewpoints.

RECREATION RESOURCES

Visual intrusions from the Proposed Action and Very Large Array Alternative would degrade the quality of the recreation experiences, especially for sightseers in the Plains of San Agustin. The Proposed Action and the Very Large Array and San Agustin alternatives would adversely affect sightseeing at Red Hill cinder cone in the Mesita Blanca WSA. The Very Large Array and San Agustin alternatives would significantly affect scenic, semi-primitive values for visitors to the western portion of Horse Mountain WSA and the northern and southern portions of Continental Divide WSA. The Gila Alternative would generally parallel two existing transmission lines through most of the Gila National Forest and the State of New Mexico portion of the Apache National Forest. The two existing lines have already significantly affected scenic, semi-primitive values for forest visitors. The cumulative effects of a third transmission line adjacent to the existing lines could have some long-term effects on recreation resources, especially in localized areas with extremely steep terrain, adjacent to U.S. Highway 180. The alternative would detract from the scenic values as viewed from the Gila and San Francisco rivers.

TRANSPORTATION NETWORKS

Increased traffic volume during construction could temporarily increase accidents and congestion at specific intersections. Movement of heavy equipment and material would accelerate the deterioration of gravel and dirt access roads and increase the need for maintenance. Although traffic increases would vary, depending on the alternative, the Proposed Action and alternatives would all similarly affect transportation.

SOCIOECONOMICS

Construction of the Proposed Action and Very Large Array Alternative routes would each generate employment for 250 workers. Thirty more workers would be needed for the San Agustin Alternative, and 70 more workers would be needed for the Gila Alternative, mainly due to steel tower construction.

Annual local government revenues during project operation would increase by $77,000 under the Proposed Action; by $79,000 under the Very Large Array Alternative; by $95,000 under the San Agustin Alternative; and by $99,000 under the Gila Alternative. The San Agustin and Gila alternatives would generate $20,000 more in local government revenues than the Proposed Action and Very Large Array Alternative because of the higher assessed value of the steel towers.

TERRESTRIAL WILDLIFE

The Proposed Action would temporarily disturb 372 acres of mule deer habitat. The Very Large Array Alternative would disturb 45 acres more than the Proposed Action; the San Agustin, 106 acres less; and the Gila Alternative, 29 acres less. A total of 168 acres of whitetail deer habitat and 16 acres of bighorn sheep habitat would be disturbed during construction of the Gila Alternative; 157 acres of elk habitat would be disturbed by the San Agustin Alternative and 64 acres of elk habitat, by the Gila Alternative.

The Proposed Action would temporarily disturb 147 acres of pronghorn habitat, The Very Large Array Alternative would disturb 30 acres more than the Proposed Action; the San Agustin 116 acres more; and the Gila Alternative, 24 acres less. The Proposed Action would temporarily disturb the least amount of black bear habitat—177 acres. The Very Large Array Alternative would disturb 30 acres more than the Proposed Action; the San Agustin Alternative, 130 acres more; and the Gila Alternative, 166 acres more.

The Proposed Action and the Very Large Array and San Agustin alternatives would temporarily disturb about the same amount of javelina habitat, ranging from 279 to 297 acres. The Gila Alternative would disturb 115 more acres of javelina habitat than the Proposed Action. The Proposed Action and the Very Large Array and Gila alternatives would disturb about the same amount of turkey habitat, whereas the San Agustin Alternative would temporarily disturb 87 more acres than the Proposed Action. The Proposed Action and Very Large Array Alternative would temporarily disturb 240 acres of quail habitat. The San Agustin Alternative would disturb 19 acres less than the Proposed Action, and the Gila Alternative would disturb 118 acres more.

FOREST MANAGEMENT

The San Agustin and Gila alternatives would conflict with the goals of the draft Gila National Forest Land Management Plan. The existing utilities corridor is full; a new corridor would have to be established to accommodate the alternative transmission lines. The Gila Alternative would slightly decrease allowable saw timber harvest and slightly conflict with forage and wildlife habitat goals. It would also conflict with implementation of the Forest Service Visual Management System.

TABLE 4-1
COMPARATIVE ANALYSIS

Element	Proposed Action	Very Large Array Alternative (A)	San Agustin Alternative (B)	Gila Alternative (C)
Total Length of Transmission Line				
Miles	203	215 (+12)	228 (+25)	173 (−30)
Estimated Cost of Transmission Line	$32,884,000	$34,357,000 (+$1,473,000)	$42,854,000 (+$9,970,000)	$40,068,000 (+$7,184,000)
Electromagnetic Interference				
Existing VLA	No Interference	No Interference	No Interference	No Interference
Future VLA Expansion	Interference	No Interference	No Interference	No Interference
Visual Resources				
Miles Significantly Affected				
VRM Class II	28.5	23.0 (−5.5)	10.5 (−18.0)	32.5 (+4.0)
VRM Class III	29.5	28.0 (−1.5)	41.0 (+11.5)	6.0 (−23.5)
VRM Class IV	5.0	3.0 (−2.0)	2.5 (−2.5)	0.0 (−5.0)
VQO Partial Retention	0.0	0.0	0.0	11.5 (+11.5) Miles Allowed

TABLE 4-1 (Continued)
COMPARATIVE ANALYSIS

Element	Proposed Action	Very Large Array Alternative (A)	San Agustin Alternative (B)	Gila Alternative (C)
Miles of Public Areas of Concern Crossed				
Plains of San Agustin	26.5	16.0 (−10.5)	1.0 (−25.5)	0 (−26.5)
U.S. Highway 180 view area	2.0	2.0 (0.0)	2.0 (0.0)	46.0 (+44.0)
U.S. Highway 60 view area	2.5	2.5 (0.0)	27.5 (+25.5)	0 (−2.0)
State Highway 26 view area	2.0	2.0 (0.0)	27.5 (+25.5)	0 (−2.0)
Cultural Resources				
Number of Known Cultural Sites within 1-Mile-Wide Corridor	39	40 (+1)	36 (−3)	124 (+85)
Acres of High Site Probability	180	180 (0)	189 (+9)	170 (−10)
Wilderness				
Wilderness Units Affected (Significance would depend on user's perspective and viewpoint.)	Mesita Blanca and Eagle Peak WSAs Continental	Mesita Blanca, Eagle Peak, Horse Mountain, and Continental Divide WSAs	Mesita Blanca, Eagle Peak, Horse Mountain, and WSA Divide WSAs	Blue Range Wilderness and San Francisco
Recreation Resources				
Values Significantly Affected	Plains of San Agustin, Mesita Blanca (Red Hill cinder cone), and Eagle Peak	Plains of San Agustin, Mesita Blanca, Eagle Peak, Horse Mountain, and Continental Divide WSAs	Mesita Blanca, Eagle Peak, Horse Mountain, and Continental WSAs	Blue Range Wilderness and San Francisco WSA; San Francisco and Gila rivers
Soils and Vegetation				
Acres Disturbed during Construction	609.0	645.0 (+36.0)	717.0 (+08.0)	464.0 (−145.0)
Miles of Sensitive Soils and Terrain Crossed	29.1	36.8 (+7.7)	41.4 (+12.3)	29.3 (+0.2)
Livestock Grazing				
Grazing Loss (AUMs/year, short term)	54	59 (+5)	66 (+12)	60 (+6))

TABLE 4-1 (Concluded)
COMPARATIVE ANALYSIS

Element	Proposed Action	Very Large Array Alternative (A)	San Agustin Alternative (B)	Gila Alternative (C)
Number of Ranch Headquarters and Dwellings within 250 Feet of Line	4	1 (−3)	2 (−2)	5 (+1)
Livestock Watering Facilities within 250 Feet of Line	0	8 (+1)	11 (+2)	9 (0)
Transportation Networks (Short-term increases)				
Accidents	12.4	12.4 (0)	13.2 (+0.8)	7.2 (−5.2)
Congestion	Yes	Yes	Yes	Yes
Maintenance	Yes	Yes	Yes	Yes
Socioeconomics				
Population Increase (short term)	250	250 (0)	280 (+30)	320 (+70)
Total Construction Employment	250	250 (0)	350 (+100)	440 (+190)
Increase in Annual Local Government Revenue during Operation ($000)	77	79 (+2)	95 (+18)	99 (+22)
Terrestrial Wildlife (Acres temporarily disturbed)				
Mule Deer Habitat (Acres)				
All Habitat	372	417 (+45)	266 (−106)	343 (−29)
Crucial Habitats	19	30	19	41
Coues Whitetail Deer Habitat	None	None	None	168 (+168)
Elk Habitat	None	None	157 (+157)	64 (+64)
Pronghorn Habitat	147	177 (+30)	263 (+116)	123 (−24)
Bighorn Sheep Habitat	None	None	None	16 (+16)
Black Bear Habitat	177	207 (+30)	307 (+130)	343 (+166)
Javelina Habitat	279	297 (+18)	285 (+6)	394 (+115)
Turkey Habitat	111	110 (−1)	198 (+87)	125 (+14)
Quail Habitat	240	240 (0)	221 (−19)	358 (+118)
Forest Management				
Conflicts with Goals of Draft Management Plan	None	None	Fire Management, Utility Corridor	Utility Corridor, Allowable Saw Timber Harvest, Visual Management, Forage and Wildlife Habitat

NOTE: Numbers in parentheses represent differences between the Alternative and the Proposed Action

WSAs = Wilderness Study Areas; VLA = Very Large Array; $000 = thousands of dollars; AUMs = animal unit months

APPENDICES

APPENDIX 1

CONSULTATION AND COORDINATION

SUMMARY OF PROJECT SCOPING

The first step in preparing a management framework plan amendment/environmental impact statement (MFPA/EIS) is to provide opportunities for the public, industry, other federal agencies, and state and local governments to meaningfully participate and comment on the "scope" of the document. The scope of an MFPA/EIS is the range of actions, alternatives, and impacts from building and operating a proposal. The purpose of "scoping" is to determine the significant concerns related to a proposed action that should be included in the MFPA/EIS. The basic goal of scoping is to make the document more concise and meaningful to persons in the federal government who must make decisions on the proposal, as well as state and local government and the public who may be affected by approval or disapproval of the proposal (Proposed Action) or its alternatives.

Method of Scoping

The Bureau of Land Management (BLM) as lead agency and the Forest Service (U.S. Department of Agriculture) as cooperating agency received 43 written responses concerning the project. Thirty-three commenters addressed the topics and requested copies of the draft MFPA/EIS. The other 10 had no comments at this time but requested copies of the draft MFPA/EIS.

The responses were received in reply to 150 scoping packages and 1,100 newsletters; presentation of the project by a BLM employee at three Board of County Commission meetings; and numerous contacts with federal, state, county, and city officials, and interested parties. There were about 20 newspaper articles, several radio reports, and one TV report on the project. Approximately 10 comments indicated a preference for one or more of the alternatives.

Results of Scoping

The significant topics that were identified included impacts to:

1. The Very Large Array (VLA) operated by the National Radio Astronomy Observatory, from electromagnetic radiation at frequencies within the operating bands of the VLA;
2. The Visual Resource Management (VRM) Class II area in the Plains of San Agustin and other areas of high visual sensitivity and scenic quality;
3. Wilderness Study Areas (WSAs) and existing wildernesses that could be affected;
4. Timber and woodlands from surface disturbing activities;
5. Soils and vegetation from surface disturbing activities and threatened or endangered plant species that occur along the routes;
6. Livestock grazing and livestock operation;
7. Wildlife and wildlife habitat, including threatened, endangered, or sensitive species;
8. Cultural resources from construction and increased visitation via any new roads;
9. Land use from separate rights-of-ways;
10. Health and welfare of human beings, if the transmission line passes over or near domestic households or communities;
11. Forest management, such as potential limitations on the use of prescribed fire as a management tool and potential for increased wildfire hazards; and
12. Local economy, employment, and tax base.

Other scoping topics of lesser importance that are briefly assessed in the MFPA/EIS include impacts to:

1. air quality;
2. paleontology;
3. dispersed recreation opportunities and developed recreation sites; and

4. existing transportation systems.

The following issues and concerns were identified but are not addressed in the MFPA/EIS because they are not within the scope or jurisdiction of the BLM:

1. compensation to private landowners for rights-of-way or access across private land;
2. compensation for damages to private land or improvements;
3. condemnation, just compensation, and fair market value of private property;
4. right-of-way widths across private property; and
5. areas to be served or not served by an electric company.

Criteria

The following criteria were used to establish standards, rules, and measures in preparing the MFPA/EIS. The criteria helped set the scope of inventory and data collection, identified the range of reasonable alternatives, and estimated the extent of analysis needed to address the issues.

1. Selection of a route that would not interfere with the frequencies within the operating bands of the Very Large Array.
2. Selection of a route that would maintain the landscape character, scenic areas, and views.
3. Selection of a route that would not cross any wilderness study areas or impair wilderness values.
4. Selection of a route that would avoid or minimize the impact on threatened, endangered, or sensitive plant species.
5. Selection of a route that would minimize disruptions to grazing and livestock operations.
6. Selection of a route that would avoid or minimize the impact on threatened or endangered wildlife species habitat, crucial wildlife habitat, and important seasonal habitat. The applicant should use existing roads and revegetate disturbed areas, where possible, or close new roads.
7. Selection of a route that would afford protection or avoidance of significant cultural sites.
8. Designation of a right-of-way corridor across public land in order to minimize adverse environmental impacts and the proliferation of separate rights-of-way.
9. Selection of a route that would minimize impacts related to forest management, including effects on timber harvest and wildfire hazards.
10. Consideration of economic and employment impacts to the region associated with project construction and long-term fiscal impacts on affected counties.

PUBLIC INVOLVEMENT

While preparing the draft MFPA/EIS for the El Paso Electric 345 kV, Springerville to Deming, Transmission Line project, the BLM consulted with many federal, state, and local agencies; elected representatives; environmental and citizens groups; industry; and individuals. Many of these participated during the scoping. The following agencies, groups, and individuals will receive a copy of the draft MFPA/EIS for review.

Federal Government Agencies

Advisory Council on Historic Preservation
Department of Agriculture
    Forest Service
    Soil Conservation Service
Department of Energy

Department of the Interior
Fish and Wildlife Service
National Park Service
Environmental Protection Agency
Federal Highway Administration

New Mexico State Government Agencies

State Clearinghouse
Department of Agriculture
Department of Finance and Administration
Department of Game and Fish
Department of Natural Resources
Historic Preservation Bureau,
State Historic Preservation Officer
Public Service Commission
State Highway Department
State Parks and Recreation
State Land Office

Local Government Agencies

Apache County Commission
Catron County Commission
Luna County Commission
Sierra County Commission
Socorro County Commission
City of Truth or Consequences

Mayor, City of Deming
Mayor, City of Springerville
Mayor, Town of Socorro
Mayor, Village of Magdalena
Mayor, Village of Reserve

Environmental Groups

New Mexico Heritage Program
Historic Preservation Bureau

New Mexico State Senators and Representatives

Representatives: Alamagordo, Silver City, Socorro
Senators: Deming, Grants, Silver City, Socorro

Industries and Individuals

(Detailed list available upon request from Jack D. Edwards, Division of EIS Services, Denver, Colorado.)

Copies of the draft MFPA/EIS may be obtained from:

Bureau of Land Management
Division of EIS Services
555 Zang Street
First Floor East
Denver, Colorado 80228

A limited number of copies may also be obtained from the following New Mexico BLM offices:

Las Cruces District Office
Post Office Box 1420
Las Cruces, New Mexico 88001

Socorro Resource Area Office
198 Neel Avenue NW
Post Office Box 1219
Socorro, New Mexico 87801

New Mexico State Office
Post Office Box 1449
Santa Fe, New Mexico 87501

APPENDIX 2

GENERAL FEDERAL RESOURCE MEASURES AND EROSION CONTROL, REVEGETATION, AND RESTORATION GUIDELINES FOR USE ON FEDERAL LANDS

GENERAL FEDERAL RESOURCE MEASURES

As a condition for granting the various rights-of-way and permits, the authorizing agencies require that certain terms and conditions be met. The general federal resource measures are presented here. As project plans are finalized and before authorization is given, specific requirements will be added by the various authorizing agencies.

Visual Resources

a. Care will be taken to assure that scenic values are not damaged during the disposal of waste materials. Any large rocks that are left in the area as a result of construction will be placed so that they do not detract from the scenic view and do not hinder the movement of livestock or big game animals. The remaining rocks will not be piled or left in rows.

b. Steel towers will be treated with a dull, dark, blackish-gray, non-reflective finish.

c. Wood pole H-frame towers will be treated with a gray wood preservative.

d. Conductors and insulators will be treated to be non-reflective.

Cultural Resources

a. "Prior to project construction, the Company, in consultation with the authorized officer and the New Mexico State Historic Preservation Officer, will use available cultural resource data to develop a plan to locate cultural resources that would be directly affected by the proposed project. A Class III (100 percent pedestrian) cultural resource inventory shall be conducted on all previously uninventoried lands of the transmission lines where surface disturbance will occur by a qualified professional archaeologist acceptable to the Bureau of Land Management (BLM). A report of the inventory will be submitted and approved by the BLM with stipulations as appropriate in order to comply with the Archeological Resources Protection Act of 1979, as amended, and Section 106 of the National Historic Preservation Act of 1966. The inventory report will evaluate cultural resources identified during the field inventory for their eligibility for nomination to the National Register of Historic Places and make recommendations for the management of all eligible or potentially eligible sites."

b. The Company will provide a BLM-approved archaeologist to execute or monitor the survey for cultural resources during construction of all project facilities.

c. If, in its operation, the Company discovers any cultural remains, monuments or sites, or any object of antiquity subject to the Antiquities Act of June 8, 1906 (34 Stat. 225; 16 U.S.C. secs. 431–433), and 43 CFR, Part 3, the Company shall immediately cease activity and report directly to the Area Manager. The BLM shall then take such action as required under the Act and regulations. The Company shall follow the mitigation requirements set forth by BLM concerning protection, preservation, or disposition of any sites or material discovered. In cases where salvage excavation is necessary, the cost of such excavations shall be borne by the Company unless otherwise stated.

d. All significant cultural resources identified within the project area will be avoided wherever possible. For significant cultural resources that cannot be avoided, a Memorandum of Agreement with the Advisory Council on Historic Preservation and New Mexico State Historic Preservation Officer will be developed

that details specific mitigation measures in accordance with 36 CFR 800.

e. The archaeologist will notify the BLM authorized officer at least 3 working days before site monitoring. Construction methods will be used that allow the archaeologist to identify buried cultural resources without endangering the personnel who are monitoring the surface disturbance. If any potentially significant buried resources are identified either along the route or on sites to be used for surface facilities and the archaeologist determines that further operations will seriously affect the cultural resources, work will be suspended and BLM will evaluate the resource and develop additional stipulations as needed. The cost of avoiding or salvaging any cultural resources identified by the archaeologist will be that of the operator. A report of all activities of the archaeologist will be submitted to BLM within 30 days after monitoring is completed.

f. The authorized officer(s) may require the Company to relocate transmission line facilities that create earth disturbance, in order to avoid destruction of archaeological or historical values or to delay construction until salvage operations are completed. All salvage from federal land shall remain the property of the United States and shall be turned over to the BLM.

Soils and Vegetation

a. In order to minimize soil compaction and watershed damage during muddy or wet periods, the BLM District Manager may prohibit construction of the transmission line until the ground is sufficiently dry.

b. Vegetation will be cut or crushed. Bulldozing will be permitted only when necessary and specifically approved by the BLM. All blading will be spread evenly across the disturbed area.

c. In areas of dense vegetation in riparian and pseudoriparian communities, the effects of clearing will be minimized by:

(1) selecting alternate routes to avoid dense vegetation or using selective clearing procedures after consultation with the BLM or land manager/owner; and

(2) using existing roads and trails where possible.

d. Vegetation to be cleared from the rights-of-way will be limited to that needed for pole installation. The Company will smooth all disturbed areas to conform as nearly as practical with the adjacent terrain. The Company shall contact the BLM District Manager for written instructions on reseeding. If the first reseeding is not successful as determined by the District Manager, one additional attempt will be required.

e. Several specific construction measures will be implemented in areas of washes, arroyos, and rivers to lessen impacts to soils, vegetation, surface waters, and runoff patterns. These measures include: using ditches, culverts, silt traps adjacent to rivers and streams, and water bars to control runoff and erosion along temporary and permanent access roads; grading and revegetating disturbed areas and carefully planning stream crossings to minimize modification of channel hydraulics and the introduction of sediments and contaminants into stream channels.

Transportation Networks

a. During construction, the Company shall regulate access and vehicular traffic as required to protect the public, wildlife, and livestock from hazards associated with the project. The Company shall permit free and unrestricted public access to and upon the rights-of-way except in areas designated as restricted by the Company. All restricted areas shall be approved in writing by the authorized officer.

b. Construction activities requiring intermittent traffic interruption will be completed as quickly as possible. Safety procedures (including use of flaggers or signs) will be followed to ensure safe, smooth traffic flow. Roadway obstructions and safety hazards will be minimized during construction by installing overhead guard pole safety barriers over the highway, which are designed to prevent the conductor from dropping during stringing and clipping. The barriers will allow safe, uninterrupted traffic flow along roadways while conductor stringing operations are underway. Potential traffic interference from movement of construction equipment will

be reduced by scheduling the movement of construction equipment during hours of light traffic flow.

c. The Company will control off-road vehicle use on the rights-of-way. Specified control could include physical barriers, replanting of trees, or other reasonable means of off-road vehicle control.

d. The Company will comply with existing federal, state, county, and private requirements developed for the protection of all existing facilities. Load limit restrictions will vary with each type of roadway and the time of the year. The restrictions could limit the hauling of heavy loads on specific roadways during specified times.

Air Quality

Major unpaved access roads will be watered or other approved dust abatement procedures will be used to prevent severe wind erosion and loss of soil materials during construction.

Wildlife

The Company will meet all the requirements contained in ***Suggested Practices for Raptor Protection on Power Lines*** (Olendorff and others 1981). Prior to construction, the Company shall provide the authorized officer with drawings that show phase spacings, configurations, and grounding practices for the transmission line. The Company shall modify any structures that are not in conformance with ***Suggested Practices for Raptor Protection on Power Lines,*** as determined by the authorized officer.

Land Uses

Disturbances of improvements such as fences, roads, and watering facilities during the construction and maintenance of the rights-of-way must be kept to an absolute minimum. If damage to improvements should occur, immediate action will be taken to restore the improvements to at least their former conditions. Functional use of these improvements must be maintained at all times.

Livestock Grazing

a. Each existing fence to be crossed by a right-of-way will be braced and tied off before cutting to prevent slacking of the wire. The opening will be protected as needed during construction to prevent livestock from escaping. Upon completion of construction, the fence will be restored to a condition which is equal to or better than the original. Cattle guards and adjacent gates of a suitable width will also be installed in any fence where regular access along a road created during this construction would be required.

b. If a natural barrier, which is used for livestock control, is broken during construction, the Company will adequately fence the area to prevent drift of livestock.

Miscellaneous

a. When all development and rehabilitation have been completed, a joint compliance check of the rights-of-way will be made by the Company and the authorized officer or designated representative to determine compliance with the terms and conditions of the grant. The Company will perform, at its own expense, any required modifications or additional reclamation work needed for compliance with the terms of the grant.

b. Whenever the authorized officer identifies a weed control problem, the Company will be responsible for weed control on disturbed areas within the exterior limits of the grant. The Company is responsible for consultating with local county weed and pest supervisors for the most appropriate weed control methods.

The Company shall comply with the applicable federal and state laws and regulations concerning the use of pesticides (including insecticides, herbicides, fungicides, rodenticides, and other similar substances) in all activities and operations under this grant. Pesticides may be used in emergency situations if approved, in writing, by the authorized officer. A pesticide shall not be used if the Secretary of the Interior has prohibited its use. A pesticide shall be used only in accordance with its registered uses and within other limitations if the Secretary has imposed

limitations. Pesticides shall not be stored on public lands.

Pesticides shall be used in accordance with written instructions from the authorized officer. These instructions should be obtained before December 1 if use is planned for the next year. Emergency use may occur with approval from the authorized officer. Any accidental pesticide or herbicide spill must be immediately reported to the State Department of Agriculture.

c. Before removing any mineral materials, such as caliche or sand and gravel which would be removed from any existing or proposed federal source, authorization must be obtained from the BLM.

d. Access roads developed in conjunction with this right-of-way will be designed to use natural corridors and avoid steep slopes where possible.

e. To prevent sediment and ground water contamination, no dumping of any type of waste material will be allowed. Any accidental chemical spill must be immediately reported to the Environmental Improvement Division in Santa Fe.

NOTE: Additional resource protection measures for National Forest land will be identified in a site-specific environmental assessment once engineering plans detailing tower locations and access routes have been prepared. At that time, BLM will also identify more detailed resource protection measures.

EROSION CONTROL, REVEGETATION, AND RESTORATION GUIDELINES FOR USE ON FEDERAL LANDS

The following guidelines will be included as stipulations for use on federal land. These procedures will be followed on federal land and on state and private lands as appropriate and agreed to by the landowner.

Standard procedures for the applicant would include implementing erosion control and revegetation measures to assure that lands disturbed by construction and operation would be restored to a similar or acceptable condition.

A detailed, site-specific reclamation plan would be developed and become part of the Construction, Operation, and Maintenance (COM) Plan. Because the areas for proposed rights-of-way and project component sites are composed of different types of terrain, soils, vegetation, land uses, and climatic conditions, the detailed plan would include sets of techniques and measures tailored to each condition encountered. Local expertise and locally effective reclamation methods would be followed when the site-specific procedures for the detailed reclamation plan are developed. The erosion control, revegetation, and restoration guidelines and COM Plan would be implemented under the direction of the appropriate agency official on public land.

On private land, information regarding applicable techniques and technical assistance concerning erosion control measures and reclamation procedures would be obtained from the Soil Conservation Service (SCS) through local Soil Conservation Districts. Technical assistance and approval of written plans for federal lands would be obtained from the BLM and Forest Service before any construction begins.

During construction of the applicants' projects, a person qualified in reclamation and revegetation would be employed by the applicant to provide on-site (1) liaison with private landowners, federal agency officials, and local governments; (2) expertise in direct, applicable restoration procedures when special conditions are encountered (without causing construction delays); and (3) monitoring of construction to ensure proper interpretation and compliance.

General erosion control and restoration guidelines have been developed for the following areas and will be included as part of the COM Plan:

1. Right-of-Way and Site Clearing
2. Road and Transmission Line Construction
3. Grading and Site Restoration
4. Revegetation (Seeding and Planting)
5. Inspection, Monitoring, and Maintenance
6. Use of Biochemicals
7. Construction Timing

Right-of-Way and Site Clearing

The timing and method of clearing rights-of-way and facility sites will take into account as appropriate: soil stability; the protection of natural vegetation; the protection of adjacent resources, such as natural habitat for wildlife; and appropriate measures for preventing silt deposits in water courses. Emphasis would be placed on protecting existing vegetation and minimizing disturbance of the existing environment by implementing the following measures:

1. Natural vegetation will be cleared only where necessary to provide electrical clearance, line reliability, and suitable access for construction, operation, and maintenance. (Determination of a hazard to the transmission line in critical areas such as park and forest lands will be a joint endeavor of the utility company and the authorized officer in keeping with the National Electric Safety Code, state, or other electrical safety and reliability requirements.)

2. Native vegetation (grasses, forbs, small shrubs, and trees), which does not pose a hazard to the transmission lines, will be allowed to grow in the right-of-way.

   Vegetation would be bladed, unless otherwise directed by the land management agency, in clearing operations where such use will preserve the cover crop of grass and low-growing brush.

3. Where trees are encountered, topping and pruning will be done rather than clearing. Topping and clearing of trees would be limited to that needed to provide clearances and safety for the conductors and not the entire right-of-way width.

4. In those areas where trees must be cleared, they will be disposed of according to the directives of the land management agency.

5. As appropriate, brush, timber, and other wood products that are cleared would be piled to the extent necessary and later shredded and chipped for use in restoration operations or disposed of at the discretion of the authorized agency.

6. Material to be burned will be piled in a manner and in such locations as to cause the least fire risk. Care will be taken to prevent fire or heat damage to desirable trees and shrubs within and adjacent to the right-of-way, to conform with local fire regulations and to minimize air pollution.

7. Brush or small trees cleared and not otherwise disposed of will be piled in such a way to provide cover habitat for small game animals and birds. Such brush piles will be screened from roads.

8. During construction, operation, and maintenance, the Company will use appropriate means to protect trees and shrubs from damage.

9. Where possible, right-of-way strips through sensitive forest and timber areas will be cleared with curved undulating boundaries. Topping and pruning of trees will be done so as to contribute to this effect, and small trees and plants will be used to feather back the rights-of-way (from grass and shrubbery to larger trees). Also, consideration will be given toward establishing native vegetation that is of value as food and cover for wildlife.

10. Where rights-of-way cross major highways and rivers in forested areas or where rights-of-way enter dense timber from a meadow, a screen of natural vegetation will be retained along the right-of-way whenever possible.

11. Land would be graded only on areas needed for access and construction.

    Where the right-of-way crossed streams and other water bodies, clearing techniques would be used to minimize disturbance, control erosion, and to prevent damage to fish and wildlife.

12. Sidehill cuts for tower sites and roads would be kept to a minimum to ensure resource protection and a safe, stable plane for efficient equipment use.

13. Clearing and grading of construction areas for camp sites, storage areas, and set-up sites will be minimal, with consideration given to minimizing erosion and conforming as much as possible to the natural topography.

14. Care would be taken to avoid spills and other types of pollution in all areas, including streams and other water bodies, and their immediate drainage areas. All spills would be immediately cleaned up.

Road and Transmission Line Construction

1. Actual construction activities would follow clearing operations as soon as possible, especially in areas with soils that are highly susceptible to wind or water erosion and other special areas.

2. The period of time that any excavations are left open would be kept to a minimum, compatible with construction requirements.

3. Soil disturbance during construction will be kept to a minimum, and restorative measures will be taken promptly in accordance with land management agency policy.

4. Trees, shrubs, grass, and natural features that are not removed will be protected, where possible, from damage during construction.

5. Erosion control measures and structures would be used where needed along the right-of-way to protect soil and vegetation. During construction, sedimentation (detention) basins and/or straw bale filters would be built near streams or lakes to prevent suspended sediments from reaching downstream watercourses or lakes, when appropriate and as required by the authorizing agency.

   Where the right-of-way crosses streams and other water bodies, the banks would be stabilized to prevent erosion. Construction techniques would minimize damage to shorelines, recreational areas, and fish and wildlife habitat.

6. During adverse weather, as determined by the on-site person qualified in reclamation and revegetation, the authorizing agency would issue stop and start orders to prevent rutting or excessive tracking of soil and deterioration of vegetation in the right-of-way on public lands.

7. Oil spills, sanitary waste, and other types of pollution will not be permitted to contaminate the land or nearby waterways.

8. New roads will be located and designed to prevent erosion and sedimentation.

9. Design and construction of all temporary roads would be in accordance with the specifications of the land management agency and would be based on an approved transportation plan that ensures proper drainage, minimizes soil erosion, and preserves topsoil. After completion of construction, these roads would be closed and areas restored without undue delay or maintained by the landowners at their discretion. Restoration, including redistribution of topsoil, would be to the satisfaction of the landowner and/or authorizing agency.

10. New roads would be designed to be compatible with the terrain to avoid excessive cutting and filling.

11. Construction at tower sites would be conducted so as to minimize erosion and protect adjacent vegetation.

12. Use of helicopters will be considered during tower construction in mountainous or otherwise inaccessible terrain, or in areas of scenic or historic significance.

13. Construction areas, such as storage sites or camp sites, will be built and maintained so as to minimize erosion and disruption to the landscape.

    The contractor will be required to provide fencing around storage yards and to keep yards clean and orderly at all times. Yards will be maintained free of weed accumulations and combustible debris so as to minimize fire hazards. Carbon dioxide fire extinguishers shall be available at each yard at all times. When the yard is no longer needed, the site shall be cleaned and left clear of ruts, fence posts, and debris of any kind.

14. Close field surveillance will be provided by the qualified reclamation person throughout the construction phase to ensure compliance with the COM Plan.

15. Water used for construction and taken from streams or other bodies of water along the corridor will be limited to volumes that will not harm environmentally sensitive areas.

Grading and Site Restoration

Construction activities commonly cause compaction and alter soil conditions which subsequently affect soil productivity and/or seeding success in the construction area. The following measures would be used to improve these soil conditions, protect soil from erosion, and provide a favorable seedbed:

1. The contour of the ground would be restored to permit favorable surface drainage.

2. All existing structures such as terraces, fences, and roads, and canals would be restored to preconstruction conditions so that they would function as originally intended.

3. Erosion control structures such as water bars, diversion channels, and terraces would be built, where appropriate, to control runoff and reduce soil erosion along the right-of-way and other adjoining areas disturbed during construction.

4. Steeply sloping areas would be cultivated and prepared on the contour to minimize erosion.

5. Suitable mulches and other soil-stabilizing practices would be used on all regraded and topsoiled areas to protect the unvegetated soil from wind and water erosion and to improve water absorption.

6. Rock mulches would be used in steep sloping, rock outcrop areas and in low precipitation areas to reduce erosion and promote vegetation growth.

7. Seedbeds for areas seeded to grass would be prepared so that they provide a firm and friable condition suitable for the establishment of grass stands.

8. Special mulching practices or matting would be needed in critical areas where wind and water are serious erosion hazards, in order to protect seeding, seedlings after germination, and plantings.

9. Soil areas with rock fragments, such as very coarse gravel, cobble, or stone scattered on the surface, would be restored to the original preconstruction surface condition to blend with the adjoining area, to avoid a smooth surface area, and to control accelerated erosion.

10. Commercial fertilizers would be applied to soil areas with low inherent fertility to maintain crop yields and establish grass seedings. Application rates would be commensurate with annual precipitation and available irrigation water.

11. Chiseling would be used, unless objected to by the landowner or authorizing agency, in rangeland areas to reduce compaction and improve soil permeability. Pitting and contour furrowing, as directed by the authorized agency or landowner, would be done on steeper slopes of disturbed areas to increase infiltration and to reduce runoff and erosion.

12. Borrow areas, as possible, will be located away from public view and will be restored to such condition that erosion will be avoided and appearance will be acceptable.

13. Where permitted, access roads and service roads will be maintained with native grass cover, appropriate side drainage, culverts, cattle guards, water bars, and the proper slope to prevent soil erosion and to provide accessibility and livestock control. After construction, temporary access roads will be chiseled and reseeded or allowed to return to their original states, as specified by the land management agency.

14. Temporary work space areas used at stream and highway crossings and other special sites would be restored to approximate preconstruction conditions and to the satisfaction of the authorizing agency.

Revegetation (Seeding and Planting)

The loss of vegetation from lands disturbed by road and transmission line construction can be mitigated by satisfactory revegetation. To ensure a successful revegetation program, methods and procedures would be consistent with local climate and soil conditions and

would follow recommendations and directions of local experts (such as an extension agent or SCS). Revegetation efforts would be continued until a satisfactory vegetation cover is established. The following practices and techniques would be used in areas where reseeding is suitable as determined by the authorizing agency:

1. Only species adaptable to local soil and climatic conditions would be used. Generally, these would be native species; however, introduced species may be considered for specific conditions when approved by the landowner and authorizing agency. Seeding rates in critical area plantings and generally throughout the right-of-way would be increased 100 percent over regular seeding rates to allow for seed mortality due to adverse growing seasons.

2. In areas with low annual precipitation (generally less than 8 to 10 inches) where seeding is not suitable or as successful, erosion control structures and measures would be applied on sloping areas to reduce accelerated erosion, to allow reestablishment of preconstruction surface soil conditions, and to allow natural revegetation.

3. Seeding would be done when seasonal or weather conditions are most favorable, as determined by the landowner or authorizing agency.

4. Seed would be planted by drilling, broadcasting, or hydroseeding. Drilling is the preferred method, because it is usually the most successful. Drill seeding with a grass drill equipped with depth bands would be used where topography and soil conditions allow operation of equipment to meet the seeding requirements of the species being planted. Broadcast seeding would be used for inaccessible or small areas. Seed would be covered by raking or harrowing. Hydroseeding would be done in critical areas determined by the reclamation specialist or authorizing agency.

5. Grazing or mowing would be delayed at least one season after seeding to provide time for vegetation to become established, especially in highly erodible areas, unless objected to by the landowner or authorizing agency.

6. Trees and shrubs would be reestablished in areas as specified in the revegetation plan.

7. Native trees, shrubs, forbs, and grass will be retained; where ecologically appropriate in critical areas, vegetation of this type will be planted under the direction of the appropriate land management agency.

Inspection, Monitoring, and Maintenance

The applicant and authorizing agency will jointly inspect the reclaimed areas to monitor the success and maintenance of erosion control measures and revegetation programs on native grazing land for two growing seasons, or for a negotiated period on private land, or for a period determined by the authorizing agency on state or federal land. The monitoring program would identify problem areas and corrective measures to ensure cover and erosion control. Certification of successful revegetation and erosion control would be determined by the landowner or authorizing agency.

1. Aerial and ground maintenance inspection of transmission line facilities will include observations of soil erosion problems and conditions of the vegetation that require attention. Aircraft will be used where possible to inspect and maintain the corridor.

2. Maintenance inspection intervals will be established so that routine maintenance will be performed when access roads are passable.

3. Maintenance vegetation clearing, particularly in critical areas, will be done on a short cycle to avoid heavy, long-term cutbacks.

Use of Biochemicals

The use of biochemicals such as herbicides, fungicides, rodenticides, pesticides, and fertilizers would comply with state and federal laws, regulations, and policies regarding the use of poisonous, hazardous, or persistent substances. State and federal wildlife agencies would be contacted if application of any of these substances would be on or near sensitive wildlife areas.

These substances would be applied by ground methods. Before using such substances on or near the permit or grant area, the applicant would obtain approval of a written plan for such use from the authorizing agency, landowner, and appropriate wildlife agency. The plan would outline the kind of chemical, method of applica-

tion, purpose of application, and other information as required, and would be considered as the authorized procedures for all applications until revoked by the authorizing agency, landowner, or appropriate wildlife agency. This plan would become part of the COM Plan.

Herbicides will not be used unless specifically requested by landowners or authorized by the land management agency. No herbicide use requirements are now known to exist.

Construction Timing

When possible, construction activities will be performed during periods most favorable to access of right-of-way area and to minimize disturbance to soil, vegetation, and livestock grazing.

APPENDIX 3

ENDANGERED SPECIES ACT COMPLIANCE

The Endangered Species Act of 1973 requires under Section 7 that any federal agency, carrying out any action that may affect an endangered species, must consult with the Fish and Wildlife Service concerning the effects of the project on threatened or endangered species.

The correspondence contained in this appendix is the Fish and Wildlife Service response to the Bureau of Land Management's request for the Section 7 listing of threatened or endangered species.

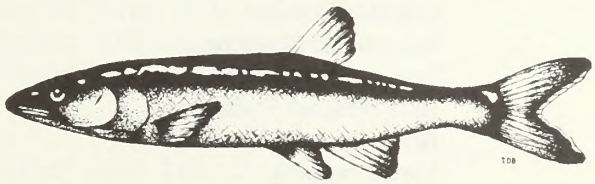
Also, included in this appendix is information on the State of New Mexico's Endangered Species law and a list of state animal species that could be affected by the Proposed Action or alternatives.

STATE OF NEW MEXICO ENDANGERED SPECIES

In 1974, the State of New Mexico enacted the Wildlife Conservation Act to protect species within the state boundaries that were in danger of being lost from "the spectrum of living things." This Act protects species in New Mexico that may be numerous elsewhere but are endangered in the state according to its definition.

An examination of distribution maps of endangered species in New Mexico (Hubbard and others 1979), indicates that about 28 species on the state list could be affected by the El Paso Transmission Line project (4 mammals, 16 birds, 4 reptiles, and 4 fish).

The New Mexico Department of Game and Fish believes that the listing of species under the Wildlife Conservation Act of 1974 is officially binding on all federal agencies and lands in the same sense as are other manifestations of state jurisdiction over resident wildlife. To the extent that any federal activity would



Chihuahua chub

constitute a violation of the Act, such activities are prohibited. Therefore, before any construction begins on the transmission line, personnel of the New Mexico Department of Game and Fish should be contacted so that appropriate mitigation or avoidance procedures can be determined for any potentially affected species.

APPENDIX 3

State of New Mexico Endangered Species[1]

SPECIES	CATEGORY[2]
Mammals	
Arizona Montane Vole	II
Coatimundi	II
Black-footed Ferret	I
Riner Otter	I
Birds	
Olivaceous Cormorant	II
Gray Hawk	I
Black Hawk	I
Bald Eagle	II
Caracara	I
Peregrine Falcon	I
Aplomado Falcon	I
Gila Woodpecker	II
Red-headed Woodpecker	II
Sulphur-bellied Flycatcher	I
Buff-breasted Flycatcher	I
Bell's Vireo	II
Varied Bunting	II
Baird's Sparrow	II
Yellow-eyed Junco	II
McCown's Longspur	II
Fish	
Chihuahua Chub	I
Spikedace	II
Loachminnow	II
Gila Topminnow	II
Reptiles	
Gila Monster	I
Narrow-headed Garter Snake	II
Sonora Mountain Kingsnake	II
Western (Arizona Blade) Rattlesnake	II

[1]Species that could occur on or along the El Paso Electric Transmission Line based on distribution maps in the Handbook of Endangered Species in New Mexico, New Mexico Department of Game and Fish, 1979. Santa Fe.

[2]Under the New Mexico Wildlife Conservation Act (1974) there are two categories of endangered species.

1. State Endangered (Group I) - Species whose prospects of survival or recruitment in the state are in jeopardy.

2. State Endangered (Group II) - Species whose prospects of survival or recruitment within the state may be jeopardized in the foreseeable future.

IN REPLY REFER TO:

5100 FG25
NM 57058

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
LAS CRUCES DISTRICT OFFICE
P.O. Box 1420
Las Cruces, New Mexico 88004

JUN 5 1984

Regional Director
U. S. Fish and Wildlife Service
P. O. Box 1306
Albuquerque, New Mexico 87103

Dear Sir:

We are preparing a Management Framework Plan Amendment/Environmental Impact Statement (MFPA/EIS) for the proposed El Paso Electric 345 KV transmission line from the vicinity of Springerville, Arizona to Deming, New Mexico. The MFPA/EIS was initiated by a right-of-way application filed by El Paso Electric.

The anticipated impacts of the proposed project and its alternatives would be caused by construction of the transmission line and its ancillary facilities. The MFPA/EIS will analyze the site-specific and cumulative effects of constructing, operating and maintaining the transmission line for the proposed route and three alternatives.

Additional information concerning the applicant's proposed project is included in the attached scoping report.

In accordance with this MFPA/EIS endeavor, we are requesting a Section 7 listing as noted below:

1. Listed and proposed endangered or threatened species of any plant or animal within the area shown on the enclosed map.

2. Designated or proposed critical habitats within the map area.

3. The name, address, and telephone number of any endangered species recovery team chairman of any species involved within the map area.

Would you please send your reply to:

Jack Edwards, Project Leader
Bureau of Land Management
Division of Environmental Impact Statement Services
555 Zang St., 1st Floor East
Denver, Colorado 80228

Any questions should be referred to Jack Edwards, Project Leader; or Ray Boyd, Wildlife Biologist, at FTS 234-6737 or the above address.

Sincerely yours,

Richard V. Watts

Daniel C. B. Rathbun
Acting District Manager

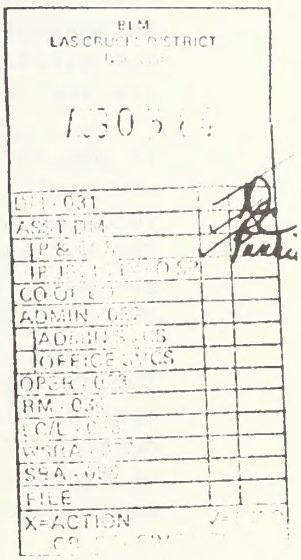
Enclosure

cc:
Project Leader, Division of EIS Services

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

Field Supervisor
Ecological Services, USFWS
Post Office Box 4487
Albuquerque, New Mexico 87196

Cons. #2-22-84-I-075



August 2, 1984

Memorandum

To: District Manager, Bureau of Land Management, Las Cruces District Office, Las Cruces, New Mexico

From: Field Supervisor, FWS, Ecological Services, Albuquerque, New Mexico

Subject Management Framework Plan Amendment/Environmental Impact Statement for the Proposed El Paso Electric 345 KV Transmission Line from Springerville, Arizona to Deming, New Mexico (Mr. Watt's 6/5/84 memorandum) (BLM)

This is in response to your subject memorandum. We apologize for the delay in responding. For expediency please send future requests for species listings to Field Supervisor, FWS, Ecological Services, P. O. Box 4487, Albuquerque, New Mexico 87196.

As provided by Section 7 of the Endangered Species Act, the Fish and Wildlife Service (FWS) furnishes, upon request, a list of Federally listed and proposed species that may be affected by Federal actions. We have used the information in your request to narrow the list of candidate, proposed and listed species for Catron, Sierra, Grant and Luna Counties, New Mexico, to those that potentially may be affected by your proposed action. We find that three candidate species may be found in your project area (see enclosure).

The Endangered Species Act (Section 7) requires Federal agencies to consult the FWS on any action which may affect listed species or their habitat. In addition, the Act requires Federal agencies to confer with the FWS on any agency action likely to either jeopardize the continued existence of any proposed species or adversely modify proposed critical habitat. The purpose of this requirement is to identify and resolve, at the early planning stage, any adverse affects.

Candidate species have no legal protection under the Endangered Species Act, but are species for which the Service has substantial information to support their listing as endangered or threatened. The development and publication of proposed rules for such species is anticipated. They are included in this document for planning purposes only.

If the Federal action involves construction that significantly affects the quality of the human environment, the Federal agency authorizing, funding, or carrying out the action will conduct a biological assessment. The assessment should state how the action will affect listed or proposed species. Preparation of the assessment may begin upon receipt of the FWS's species list.

The biological assessment shall be completed within 180 days after receipt of the species list, unless it is mutually agreed to extend this period. If the assessment is not initiated within 90 days after receipt of the species list, we suggest its accuracy be verified before conducting the assessment.

The biological assessment should include as a minimum:

1) onsite inspection of the area affected by the proposed action. This inspection should include a detailed survey of the area to determine if species are present and if suitable habitat exists for either expanding the existing population or potential reintroductions of populations;

2) interviews with recognized experts on the species including personnel of the FWS, State conservation departments, universities, and others who may have data not yet found in scientific literature;

3) review literature and other scientific data to determine the species distribution, habitat needs, and other biological requirements;

4) review and analysis of the effects of the proposed action on individuals and populations, including consideration of both direct and indirect effects of the proposal on the species and its habitat;

5) analysis of alternative actions that may promote conservation of the species;

6) other relevant information;

7) written report documenting the assessment results.

If the Federal action does not significantly affect the quality of the human environment, there is no need to prepare a biological assessment. However, it remains incumbent upon the Federal agency to assess whether its action may affect endangered and threatened species.

If the Federal agency determines its proposed action may affect listed species, the Federal agency shall initiate formal Section 7 consultation by writing to the Field Supervisor, FWS, Ecological Services, P.O. Box 4487, Albuquerque, New Mexico 87196. If no effect is evident, there is no need for further consultation. However, I would appreciate the opportunity to review the assessment.

We suggest you contact the New Mexico Department of Game and Fish and the New Mexico Natural Heritage Program for information concerning fish, wildlife and plants of State concern.

If you have any questions, please call Gerry Roehm at (505) 766-3966 or FTS 474-3966.

John C. Peterson

Enclosure

cc: (w/cy Encl)
Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico
Director, New Mexico Heritage Program, Santa Fe, New Mexico
Regional Director, FWS, HR and SE, Albuquerque, New Mexico

PROPOSED EL PASO ELECTRIC 345 KV TRANSMISSION LINE, SPRINGERVILLE, ARIZONA TO DEMING, NEW MEXICO

Listed Species

None.

Proposed Species

None.

Candidate Species

1. Loach minnow
   Tiaroga cobitis

   Found in riffle habitat in the mainstem Gila and San Francisco Rivers and some tributaries (Tularosa, Whitewater, Dry and Blue Creeks) in Catron, Grant and Hidalgo Counties.
   Authority: Mr. Michael Hatch New Mexico Department of Game and Fish, State Capitol, Santa Fe, New Mexico 87503 (505) 827-2438.

2. Spikedace
   Meda fulgida

   Found in shallow runs in streams in the mainstem Gila River and the east and middle forks of the Gila River, Catron and Grant Counties, New Mexico.
   Authority: Mr. Michael Hatch, New Mexico Department of Game and Fish, State Capitol, Santa Fe, New Mexico 87503 (505) 827-2438.

3. Mimbres figwort
   Scrophularia coccinea or *macrantha*

   Found in the Cooke Range north of Deming, New Mexico. Habitat consists of dry, steep hillsides around rocks, in rock crevices, in shade or partial sun in ponderosa pine-pinyon pine-juniper transition at 6500 to 7,000 feet. It is found in granite substrates with *Quercus* and *populus*.
   Authority: Mr. Paul Knight, New Mexico Heritage Program, State Capitol, Santa Fe, New Mexico 87503 (505) 827-7866.

Critical Habitat

None.

1792 (D-490)
El Paso

AUG 15 1984

Lynn Martinez
State of New Mexico
Natural Resources Department
Resource Management Bureau
Villagra Building
Santa Fe, New Mexico 87503

Dear Ms. Martinez:

We are preparing a Management Framework Plan Amendment/Environmental Impact Statement (MFPA/EIS) for the proposed El Paso Electric 345 KV transmission line from the vicinity of Springerville, Arizona to Deming, New Mexico. The MFPA/EIS was initiated by a right-of-way application filed by El Paso Electric.

The anticipated impacts of the proposed project and its alternatives would be caused by construction of the transmission line and its ancillary facilities. The MFPA/EIS will analyze the site-specific and cumulative effects of constructing, operating and maintaining the transmission line for the proposed route and three alternatives.

Additional information concerning the applicant's proposed project is included in the attached scoping report.

In accordance with this MFPA/EIS endeavor, we are requesting your assistance in identifying threatened or endangered plant species that could be encountered along the proposed route and alternatives.

Would you please send your reply to:

Jack Edwards, Project Leader
Bureau of Land Management
Division of Environmental Impact Statement Services
555 Zang Street, 1st Floor East
Denver, Colorado 80228

Any questions should be referred to Jack Edwards, Project Leader, or Ray Boyd, Wildlife Biologist, at (303) 234-6737 or above address.

Sincerely,

/s/ Jack D. Edwards

Jack D. Edwards
Project Leader

Enclosure

D-490/JDE/BKW/8-15-84/x6737

RECEIVED
NOV 26 1984
EIS OFFICE

STATE OF NEW MEXICO
NATURAL RESOURCES DEPARTMENT

RESOURCE MANAGEMENT & DEVELOPMENT DIVISION
VILLAGRA BUILDING, SUITE129
SANTA FE, NEW MEXICO 87503
(505) 827-7850

TONEY ANAYA
GOVERNOR

LEO GRIEGO
SECRETARY

November 21, 1984

Mr. Ray Boyd
Bureau of Land Management
Division of Environmental Impact
Statement Services
555 Zang Street, First Floor East
Denver, Colorado 80228

Dear Mr. Boyd:

We have examined the map and other information you sent reference MFPA/EIS for the proposed El Paso Electric transmission line from Springerville, Arizona to Deming, New Mexico.

The following federally listed plant taxa of special concern are known to occur in the vicinity of the proposed route or its alternatives:

Taxa	Federal Status
Pediocactus papyracanthus	Candidate for federal listing
Erigeron rhizomatous	Candidate for federal listing
Helianthus paradoxus	Candidate for federal listing
Cereus greggii	Candidate for federal listing
Eriogonum densum	Candidate for federal listing
Lesquerella gooddingii	Candidate for federal listing
Mammillaria viridiflora	Candidate for federal listing

In addition, the following state listed taxa of concern are likely to occur in these areas:

Mammillaria wrightii
Tetradymia filifolia
Cryptantha paysonii
Coryphantha scheeri
Agastache mearnsii
Agastache cana
Talinum longipes
Talinum humile
Crataegus wootoniana
Castilleja organorum
Penstemon dasyphyllus

The number of species on this list will be reduced somewhat depending on which route is finally selected. We recommend a survey for threatened and endangered plant species be carried out when the route for the transmission corridor is decided on.

If we can be of further assistance, please call.

Sincerely,

David Deardorff, Ph.D.
Plant Ecologist
Resource Survey

DD:ls

APPENDIX 4

ELECTROMAGNETIC INTERFERENCE CALCULATION METHODOLOGY

The electromagnetic interference from corona was calculated for the proposed 345 kV transmission line using empirical formulas that have been developed by the Bonneville Power Administration for predicting television interference (TVI) at 75 MHz.

The formulas were derived from a combination of data collected at 75 MHz during steady rain conditions (Chartier and Stearns 1981) and data collected by Pakala and Chartier (1971) over a wide frequency range. The empirical formula calculates the TVI for an IEC/CISPR Quasi-Peak (QP) detector (ANSI C63.2-1980; IEC, CISPR 16-1977).

The CISPR QP detector has a 1-ms change and a 550-ms discharge time constant. It also has a -6 dB bandwidth of 120 KHz.

The Bonneville Power Administration formulas and a detailed discussion of them can be found in "Empirical Expressions for Calculating High Voltage Transmission Corona Phenomena" (Chartier 1983).

The TVI at 75 MHz were calculated for each phase using the following formula.

$$TVI = 10.0 + 120 \log_{10}\left(\frac{E}{16.3}\right) + 30 \log_{10}\left(\frac{D}{30.4}\right)$$

$$+ 20 \log_{10}\left(\frac{75.0}{f}\right) + \left(\frac{q}{300}\right) + C$$

WHERE: E = conductor surface voltage gradient kVrms/cm

D = subconductor diameter, mm

f = frequency, MHz

q = altitude, meters above sea level

C = correction factor

The constants are from a 345 kV transmission line in New York where excellent TVI data during steady rain has been obtained (Chartier and Pakala 1975). Measurements of TVI from Bonneville Power Administration lines have agreed quite well with calculated levels using this equation (Chartier and Stearns 1981).

C is the correction factor to calculate the TVI at the radial distance from each phase. It can be determined from the Pakala-Chartier paper (1971). C can also be determined by considering the four distinct cases shown in Table A4-1.

The calculations were made for the worst-case conditions of:

1. Maximum voltage of 362 kV even though the normal operating voltage of the El Paso Electric 345-kV system is closer to 350 kV.

2. Foul weather conditions even though foul weather conditions are probably less than 10 percent in this part of New Mexico.

The conductor surface gradients for the conductors being considered for this line at 362 kV are:

MAXIMUM CONDUCTOR SURFACE GRADIENTS (kVrms/cm)

PHASE	SUBCONDUCTOR DIAMETER	
	1.108 inch	**1.196 inch**
A	16.72	15.69
B	18.17	17.06
C	16.72	15.69

The results of these EMI calculations at 75 MHz are expressed in dBuV/m/120 KHz, Quasi-Peak.

Now, to translate these calculations to the same units as the Very Large Array (VLA) limits, one must know how the various detectors respond to corona noise. One must also know how to correct the levels for different instrument bandwidths. The VLA limits are based upon noise power, whereas the above calculations are QP voltage. However, to measure or calculate noise power requires a measurement of calculation of root mean square (rms) voltage. All the measurements that have been conducted to date show that corona noise as measured with an rms detector is about 10 dB less than for a QP detector. All the measurements to date for an rms detector clearly show that the correction for bandwidth is directly proportional to the square root of the bandwidth or

APPENDIX 4

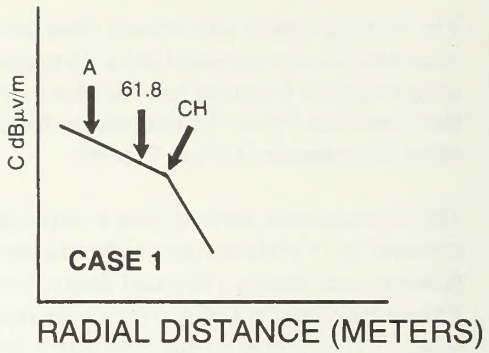
TABLE A4-1

CASE 1: Do < CH
A < CH

Both the reference point and the measuring point lie on the 20 dB/decade slope of the curve.

The value of C is therefore determined by:

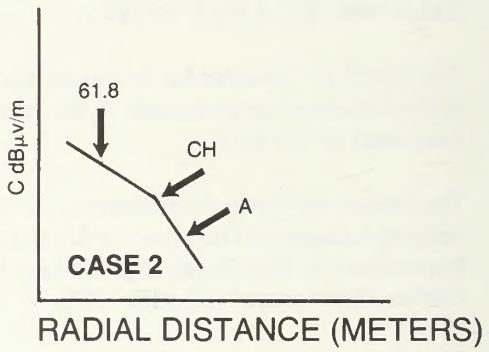
$C = 20 \log_{10}(Do/A)$



CASE 2: Do < CH
A > CH

If Do < CH and A > CH, we must move from the reference point down to the measuring point. Therefore:

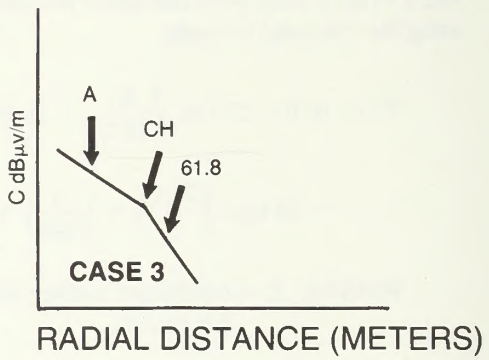
$C = 20.0 \log_{10}(Do/CH) + 40.0 \log_{10}(CH/A)$



CASE 3: Do > CH
A < CH

In this case we must move up from the reference point to the measuring point.

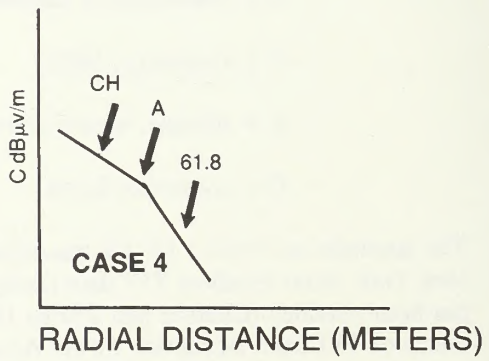
$C = 20.0 \log_{10}(CH/A) + 40.0 \log_{10}(Do/CH)$



CASE 4: 61 > CH
A > CH

In this case both points lie on the 40 dB/decade portion of the curve. Therefore:

$C = 40.0 \log_{10}(Do/A)$



$$dB = 10 \log_{10} BW_1/BW_2$$

WHERE: BW is bandwidth in Hz

Therefore, to correct the QP data to rms units per Hz bandwidth, a total of

$$10 + 10 \log 120{,}000/1$$
$$= 60.8 \text{ dB}$$

has to be subtracted.

The thresholds, however, are based upon noise power rather than noise voltage.

The following equation is used to correct voltage to power:

$$P = E^2/Z$$

WHERE: P = noise power $W/m^2/Hz$
E = noise voltage V/m/Hz
Z = impedance of free space
= 377 ohms

Therefore, the total correction in converting the original electromagnetic interference calculation in QP units at a 120 KHz bandwidth to power units at $dBw/m^2/Hz$ is:

$$dBW/m^2/Hz = {}^{E}dB\mu V/m/Hz - 145.8 - 60.8$$

$$= {}^{E}dB\mu V/m/Hz - 206.6$$

or in terms of dB

$$P_{dB} = 10 \log_{10} E^2 - 10_{10} \log Z$$

$$P_{dB} = E_{dB} - 25.8$$

Since radio noise is usually measured in $dB\mu V/m$,

$$P_{dB} = e_{dB} - 25.8 + 10 \log_{10} (10^{-6})2$$

$$\text{or } = E_{dB\mu V} - 145.8$$

APPENDIX 5

VISUAL RESOURCE MANAGEMENT METHODOLOGIES

The Bureau of Land Management's (BLM) Visual Resource Management (VRM) system and the Forest Service's Visual Management System (VMS) were used to analyze the landscape where the Proposed Action or alternatives would cross. To compare the visual impacts of the proposed project, the VRM system was applied to lands managed by BLM as well as other federal, state, local, and private lands. The VMS procedure was applied to National Forest lands.

The following sections describe the VRM system, the VMS, and the BLM contrast rating procedure, and explains how the systems were applied to the proposed project. For further explanation of each process, see the sources used as the basis for the discussion.

THE BLM VISUAL RESOURCE MANAGEMENT SYSTEM

The VRM system is an analytical process that identifies, sets, and meets the objectives for maintaining scenic values and visual quality (BLM 1978, 1980b). The system is based on research that has produced ways of objectively assessing aesthetic qualities of the landscape. Aesthetic judgments considered extremely subjective were found to have identifiable, consistent qualities that can be described and measured. Whatever the terrain and whoever the observer, perception of visual quality in a landscape seems to be based on three common principles: landscape character; influence of form, line, color, and texture; and visual variety.

Landscape character is mainly determined by the four basic visual elements of form, line, color, and texture. Although all four elements exist in every landscape, they exert varying degrees of influence. The stronger the influence exerted by these elements, the more interesting the landscape. The more visual variety in a landscape, the more aesthetically pleasing the landscape. Variety without harmony, however, is unattractive, particularly if alterations or modifications are made carelessly.

The VRM system (see Figure A5-1 for flow diagram) involves a four-step process: (1) determining the scenic quality of a landscape; (2) measuring the visual sensitivity of an area; (3) determining the distance zones; and (4) compiling all the information into management classes for guidance in assessing environmental impacts.

Scenic Quality

Scenic quality is perhaps best described as the overall impression retained after driving through, walking through, or flying over an area. In the VRM process, rating scenic quality requires a brief description of the existing scenic values in a landscape.

When inventoried, an area is first divided into subunits that appear homogeneous generally in terms of landform and vegetation. Each area is then rated by seven key factors: landform, vegetation, water, color, influence of adjacent scenery, scarcity, and cultural modification. A standardized point system assigns great, some, or little importance to each factor. The values for each category are calculated, and, according to total points, three scenic quality classes are determined and mapped:

Class A Areas that combine the most outstanding characteristics of each rating factor.

Class B Areas that combine some outstanding features and some features that are fairly common to the physiographic region.

Class C Areas where the features are fairly common to the physiographic region.

Sensitivity Levels

Although landscapes have common elements that can be measured, there is still a subjective dimension to landscape aesthetics. Each viewer brings perceptions formed by individual influences, culture, visual training, familiarity with local geography, and personal values.

To measure regional and individual attitudes in evaluating a landscape, visual sensitivity is determined

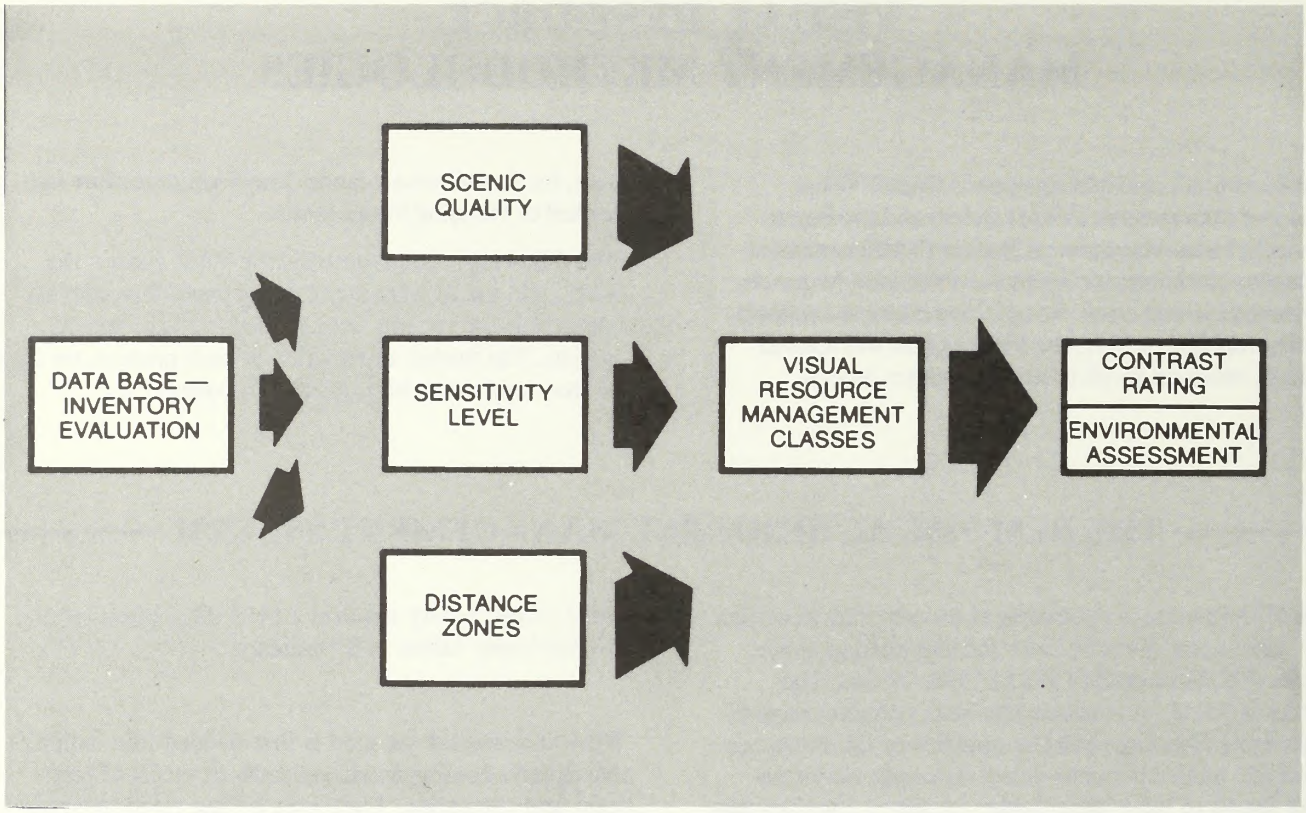


Figure A5-1 The Visual Management System Process

(1) by measuring use volume and (2) by determining user or public reaction.

USE VOLUME

Frequency of travel through an area (by road, trail, and river) and use of an area (for recreation, camping, and events) are calculated. The area is then assigned a high, medium, or low rating according to predetermined classifications.

USER OR PUBLIC REACTION

Public groups are familiarized with the area (if necessary) and asked to respond to activities that will modify that landscape. The concern they express about proposed changes in scenic quality is also rated high, medium, or low.

The various combinations of use volume and user reaction for each area are converted by use of a matrix to an overall sensitivity rating of high, medium, or low. A map is then developed that shows these sensitivity levels.

Distance Zones

The visual quality of a landscape (and user reaction) may be magnified or diminished by the visibility of the landscape from major viewing routes and key observation points.

A landscape scene or "seen area" can be divided into three basic distance zones: (1) foreground/ middleground, (2) background, and (3) seldom-seen. Because areas that are closer have a greater effect on the observer, such areas require more attention than areas that are farther away. Distance zones allow consideration of the closeness of the observer to the landscape.

Selecting the key viewing points and accurately assessing distance zones require some judgment. Where several routes exist, what is foreground from one route may be background from another (the more restrictive designation is used). Atmospheric conditions may also modify the perception of distance.

The process results in a final distance zone map.

Management Classes

Management classes describe the different degrees of change allowed to the basic elements of the landscape. Class designations are derived from an overlay technique that combines the maps of scenic quality, sensitivity levels, and distance zones. The overlays are used to identify areas with similar combinations of factors. These areas are assigned to one of five management classes according to predetermined criteria. The resulting map of contiguous areas sharing the same VRM class is used to assess the visual impact of proposed development.

The five classes are as follows:

Class I — Class I provides mainly for natural ecological changes; management activities are to be restricted and are not to attract attention.

Class II — In Class II areas, changes in the basic elements by management activities should not be evident in the characteristic landscape.

Class III — In Class III areas, contrasts to the basic elements may be evident and begin to attract attention, but they should remain subordinate to the existing characteristic landscape.

Class IV — In Class IV areas, alterations may attract attention but should repeat the form, line, color, and texture characteristics of the landscape.

Class V — In Class V areas, rehabilitation is needed to restore the landscape to the character of the surrounding landscape.

THE FOREST SERVICE VISUAL MANAGEMENT SYSTEM

The VMS establishes criteria for identifying and classifying scenic qualities as well as aesthetic concern for those qualities on National Forest lands (FS 1974). The process establishes quality objectives for altering the visual resource be recognizing the great variation in visual strength of the various types of natural landscapes and their inherent capabilities to accept change. In this process, a particular landscape is placed within a framework for analysis. (See Figure A5-2 for diagram.) The framework is the character type or common distinguishing visual characteristic of landform, water forms, and vegetative patterns based upon physiographic regions as defined by Nevin M. Fenneman (1931). The characteristic landscape is the naturally established landscape being viewed; it serves as the final basis for analyzing and comparing the appropriateness of a management activity against the prescribed Visual Quality Objective (VQO).

The VQO incorporates the extreme variability of the land's scenic quality, the visual sensitivity of the land, and the ability of various forest landscapes to undergo alteration.

Variety Classes

Variety classes are obtained by classifying landscapes into those where the scenic quality is most important and those where it is of lesser value. The classification is based on the premise that all landscapes have some value, but those with variety or diversity have the greatest potential for high scenic value. There are three variety classes that identify the scenic quality of the natural landscape:

Class A (Distinctive) — Areas where features of landform, vegetative patterns, water forms, and rock formations are of unusual or outstanding visual quality. They are usually not common in the character type.

Class B (Common) — Areas where features contain varieties in form, line, color, and texture or combinations thereof, but which tend to be common throughout the character type and are not outstanding in visual quality.

Class C (Minimal) — Areas where features have little change in form, line, color, or texture. Includes all areas not included in Classes A and B.

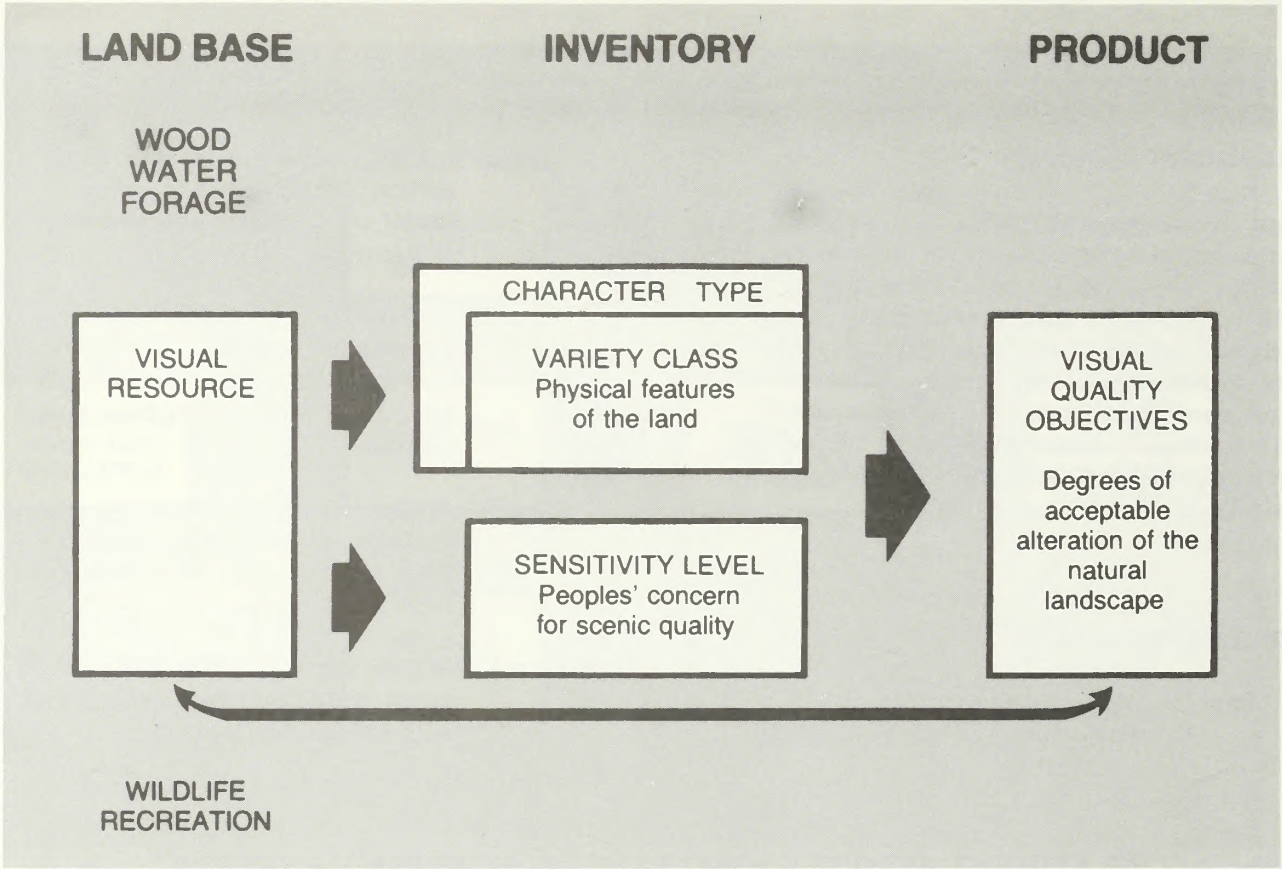


Figure A5-2 The Visual Resource Management System Process

Sensitivity Levels

Sensitivity levels are a measure of human concern for the scenic quality of the National Forest. These levels are determined for land areas viewed by those who are travelling through the forest on developed roads and trails, are using areas such as campgrounds and visitor centers, or are recreating at lakes, streams, and other water bodies. All National Forest land is seen at least by aircraft users; therefore, some degree of visitor sensitivity exists for the entire land base.

Three sensitivity levels, each identifying a different level of user concern for the visual environment, are employed:

Level 1 (Highest Sensitivity) Level 1 includes all areas seen (seen areas) from ***primary*** travel routes, use areas, and water bodies where, as a minimum, at least 25 percent of the forest visitors have a major concern for the scenic qualities. Level 1 also includes all areas seen from ***secondary*** travel routes, use areas, and water bodies where at least 75 percent of the forest visitors have a major concern for the scenic qualities.

Level 2 (Average Sensitivity) Includes all areas seen from ***primary*** travel routes, use areas, and water bodies where fewer than 25 percent of the forest visitors have a major concern for scenic qualities. Level 2 also includes all areas seen from ***secondary*** travel routes, use areas, and water bodies where at least 25 percent and not more than 75 percent of the forest visitors have a major concern for scenic qualities.

Level 3 (Lowest (Sensitivity) Includes all areas seen from ***secondary*** travel routes, use areas, and water bodies where less than 25 percent of the forest visitors have a major concern for scenic qualities, and all National Forest land not seen from any travel route, use area, or water body. (Level 3 does not include any area seen from ***primary*** routes or areas.)

Sensitivity levels are correlated with distance zones of foreground, middleground, and background for seen areas established in the sensitivity level determination. This step correctly emphasizes the viewers' concern for scenic quality within the system.

Quality Objectives

The VQO's are designed to develop measurable standards or objectives for the visual management of all National Forest lands. The objectives are based on the previously determined variety classes and sensitivity levels. They are represented by the following five terms which can be defined as visual resource management goals.

Preservation (P)	Preservation allows for ecological changes only. Management activities, except for very low visual impact recreation facilities, are prohibited.
Retention (R)	Activities may only repeat form, line, color, and texture which are frequently found in the characteristic landscape.
Partial Retention (PR)	Management activities must remain visually subordinate to the characteristic landscape. Activities may repeat or introduce form, line, color, or texture common to the characteristic landscape, but changes in their size, amount, intensity, direction, pattern, etc., must remain visually subordinate to the characteristic landscape.
Modification (M)	Modification activities may visually dominate the original characteristic landscape. However, vegetation and landform alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that the visual characteristics are those of natural occurrences within the surrounding area or character type. Additional elements must remain visually subordinate to the proposed composition.
Maximum Modification (MM)	Vegetation and landform alterations may dominate the characteristic landscape. However, when viewed as background, the visual characteristics must be those of natural occurrences within the surrounding area or character type. When viewed as foreground or middle ground, they may not appear to borrow completely from naturally established form, line, color, or texture.
Unacceptable Modification (UM)	Management activities demonstrate excessive modification in the landscape regardless of the distance from which the management activity is observed. Usually the size of the activity is not to scale or is so excessive as to contrast with the characteristic landscape.

THE BLM VISUAL RESOURCE CONTRAST RATING SYSTEM

The objective of the visual resource contrast rating system is to provide a measure of whether the Proposed Action or alternatives will meet the requirements of the assigned VRM classes (BLM 1978 and 1980b). The degree to which a management activity adversely affects the visual quality of a landscape depends on the extent of visual contrasts created between the activity and the existing landscape character. Contrast is measured by separating the landscape into land and water surfaces, vegetation, and structures and then predicting the amount of contrast with the basic elements (form, line, color, and texture) for each of these major features. Assessing the degree of contrast will show the severity of impact and will guide the plans for mitigating the contrasts to meet the requirements of the VRM classes. Contrasts are considered from the most critical viewpoints for distance, angle of observation, length of time, relative size of the project, season of the year, light, and the effects of time on the healing process.

APPLICATION OF THE VRM SYSTEM TO THE PROPOSED PROJECT

Areas of landscape change expected to result in high visual contrast if the Proposed Action or alternatives were to be implemented were evaluated for contrasts. The analysis of the degree of contrast considered the following factors: the duration of view, numbers of viewers, angle of observation, relationship to other views, seasonal change, construction techniques, ease of revegetation, and proposed restoration methods (Appendix 2). In addition, the following specific questions were integral to the impact analysis of the proposed project:

1. When existing transmission lines were paralleled, would tower design and other visual characteristics be compatible and similar in scale to each other; would the addition of another line visually dominate the landscape (examples: Proposed Action or alternatives near Deming; the San Agustin Alternative between Deming and Nutt; the Gila Alternative along the existing TEPC transmission line)?

2. At highway crossings, would alignment cross as nearly perpendicular to the highway as possible, remain below the horizon, and have as little line as possible visible from the highway (examples: Proposed Action or alternatives crossing U.S. Highway 60; Proposed Action or the Very Large Array or San Agustin alternatives crossing State Highway 12; the Gila Alternative crossing U.S. Highway 180 near intersection with State Highway 12)?

3. What would be the duration and ease of view of the project from communities, rural residences, ranch headquarters, and other sensitive viewpoints; would long-term views be within generally natural-appearing landscapes (examples: ranch headquarters east of the Black Range in the Plains of San Agustin, south of U.S. Highway 60, and along the Gila Alternative route between Deming and the junction of U.S. Highway 180 and State Highway 12)?

4. What would be the scale relationship of the transmission line, especially the towers, within the landscape unit or with landscape features—compatable or dominating (examples: the San Agustin Alternative between Deming and Nutt; the Proposed Action, the Very Large Array, or San Agustin alternatives east of the Black Range; the Proposed Action or the Very Large Array Alternative through the Plains of San Agustin; the Proposed Action or the Very Large Array or San Agustin alternatives near the development of Mangas; U.S. Highway 60 crossing; numerous points along U.S. Highway 180 along the Gila Alternative route)?

5. Would the colors and reflective qualities of the materials tend to diminish the presence of the transmission line over short distances, or would they be visually evident for many miles (examples: Proposed Action or Very Large Array Alternative between Deming and Nutt; Proposed Action or the Very Large Array or San Agustin alternatives east of the Black Hills; the Proposed Action or the Very Large Array or San Agustin alternatives through and along the Plains of San Agustin; the Gila Alternative between Deming and Silver City and at the U.S. Highway 60 crossing)?

6. Would the earthwork required for access roads and tower foundations be visible over a great distance for the long term (generally would not apply as long as access is sensitively planned through National Forest areas)?

7. Would vegetation clearings simulate natural patterns or blend with existing vegetation patterns along existing transmission line clearings (examples: the San Agustin Alternative south and west of the Plains of San Agustin; the Gila Alternative through National Forest lands)?

The following assumptions were made during the visual resource impact analysis:

1. The measures outlined in Appendix 2 would be followed.

   (a) steel towers would be treated with a dull, dark, blackish-gray, non-reflective finish; new tower design would attempt to match that of existing towers;

(b) conductors and insulators would be treated to be non-reflective; and

(c) wood pole H-frame towers would be treated with a light gray wood preservative process.

2. Visible impacts from towers and conductors would be diminished to a point of acceptable contrast beyond a distance of approximately 2 miles;

3. Very few access roads (presently undefined) would be built, since much of the area along the routes would be through open, flat to rolling, easily accessible terrain. In mountainous, forested areas many access roads are presently established, or helicopter or ORV vehicles would be used. In either case, the impacts from the structural contrast would outweigh landform and vegetation impact, especially in duration.

APPENDIX 6

NATIONAL PARK SERVICE CONSULTATION NATIONWIDE RIVERS INVENTORY PROGRAM AND NATIONAL TRAIL SYSTEMS ACT

The correspondence contained in this appendix is in compliance with the ***Federal Register*** Consultation Procedures (1980) for rivers identified in the Nationwide Rivers Inventory. This appendix also includes information on the potential effects of the project on the Continental Divide National Scenic Trail.

IN REPLY REFER TO:
5100 FG25
NM 57058

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
LAS CRUCES DISTRICT OFFICE
P.O. Box 1420
Las Cruces, New Mexico 88001

June 19, 1984

Memorandum

To: Regional Director, Southwest Region

From: District Manager, Las Cruces

Subject: Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the Nationwide Rivers Inventory Program, and Potential Adverse Effects on Trails in the National Trails System.

The El Paso Electric Company (EPE) on October 4, 1984, filed an application with the Bureau of Land Management (BLM) for a right-of-way grant to construct, operate and maintain a 345 kilovolt (KV) transmission line. EPE proposes to build the approximate 205 mile long transmission line from a point on Tucson Electric Power Company's existing 345 KV transmission line near Red Hill, New Mexico to their Luna substation located about 1.5 miles north of Deming, New Mexico. Approximately 80 miles of the proposed route would cross BLM administered lands. In response to this application and in accordance with the National Environmental Policy Act and regulations published by the Council on Environmental Quality, the BLM has been assigned as the lead agency to prepare a Management Framework Plan Amendment/Environmental Impact Statement (MFPA/EIS). Besides the Proposed Action route, the MFPA/EIS will also analyze environmental impacts for three Alternative routes and a No Action alternative (refer to enclosed 100 K map for route locations).

A preliminary review of the proposed transmission line route and alternative routes reveals that both the Gila and San Francisco Rivers identified by the National Park Service on the Nationwide River Inventory list would be crossed by Alternative C.

As directed by the September 8, 1980, Federal Register Notice (Vol. 45, No. 175), we are requesting your assistance in determining whether the transmission line for Alternative C could have adverse effects on the natural, cultural, and recreation values of these inventory river segments. Because of physiographic constraints and Forest Service requirements, the transmission line towers for Alternative C and other alternative routes crossing National Forest System Lands would use metal instead of wooden towers. Otherwise, all other construction techniques and activities would be similar to those described in the Project Description (refer to enclosure Chapter 1, Proposed Action and Alternatives).

In addition to the river crossings, our preliminary review has determined that the Continental Divide National Scenic Trail would be crossed several times by

the Proposed Action and Alternatives A, B, and C. We would appreciate your assistance in determining what effects the transmission line would have upon the recreational, scenic, and cultural values of this trail.

The following items are being sent under seperate cover:

1. Project Description, Chapter 1, Proposed Action and Alternatives;

2. 100 K map depicting the project area of study and route locations (including map index) and;

3. 7 ½" minute quadrangle maps depicting the points along the transmission line routes where the Gila and San Francisco Rivers, and Continental Divide National Scenic Trail would be crossed.

Because of tight schedule deadlines to develop the MFPA/EIS, I would appreciate your assistance and response by July 8, 1984. Please forward your response to my office in Las Cruces, and we in turn will transmit your response to the MFPA/EIS Team in Denver.

We look forward to working closely with you and your staff in order to implement the Federal Register Consultation Procedures for rivers identified in the Nationwide Rivers Inventory. Your assistance on potential effects upon the Continental Divide National Scenic Trail would also be appreciated.

Should you wish to discuss this matter in further detail, please contact me, or Marvin James of my staff at FTS 8-571-8312, or commercial 505-524-8551.

Enclosures

Acting District Manager

United States Department of the Interior
NATIONAL PARK SERVICE
SOUTHWEST REGION
P.O. Box 728
Santa Fe, New Mexico 87501

IN REPLY REFER TO:
L7619(SWR-PE)

JUL 6 1984

Memorandum

To: District Manager, Las Cruces District Office, Bureau of Land Management, Las Cruces, New Mexico

From: Acting Associate Regional Director, Planning and Cultural Resources, SWR

Subject: Review of Scoping Report, Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the Nationwide Rivers Inventory, and Potential Adverse Effects on Trails in the National Trails System

We have reviewed the subject reports and are providing the following comments on a technical assistance basis.

The scoping report should include the potential impacts to Nationwide Rivers Inventory rivers and the Continental Divide National Scenic Trail (CDNST) as significant issues and concerns. Gila Cliff Dwellings National Monument is in the project vicinity but should not be impacted by the proposal.

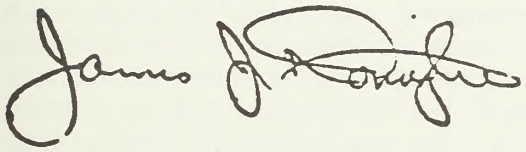
Mitigation measure 16 should specifically mention the requirements of Section 106 of the National Historic Preservation Act and its implementing regulations contained in 36 CFR 800. It should further state that the Departmental Consulting Archeologist, Department of the Interior, National Park Service, Washington, DC 20240 (202/343-4101) should be contacted in the event of an emergency discovery of cultural resources.

We support the proposed action as having the least impacts on programs under our jurisdiction. The proposed action would cross the CDNST once and would not cross the San Francisco or Gila Rivers which are included in the Nationwide Rivers Inventory. We recommend that the CDNST crossing be rerouted slightly to follow the existing light duty road, about ½ mile north of the proposed transmission line on map #23. Using an existing transportation corridor would concentrate impacts in an already disturbed area and would not create a new corridor or intrusion.

As indicated in the project information, Alternative A would cross the CDNST in two additional areas, Alternative B would cross the CDNST in two additional areas, and Alternative C would cross the San Francisco River twice and the Gila River once. While we do not consider that construction of the transmission line would

constitute a major significant impact on these resources, we again recommend that the proposed action be selected since it would have the least impact to the CDNST and would not impact the rivers. However if Alternative A, B, or C is selected, we recommend that the transmission line be routed to utilize existing transportation and utility corridors. For example, on map #15C, the line crosses the CDNST at an existing unimproved road. However, on map #15B, the transmission line crosses in a new area; and we would likely recommend that the line parallel the unimproved road to the north which follows Alamo Canyon.

If the proposed action is not selected, we would be pleased to coordinate further with you in plannning for mitigation of the additional impacts associated with Alternative A, B, or C.



APPENDIX 7

SOIL GROUPS, VEGETATION TYPES, AND EROSION CONTROL, RECLAMATION, AND REVEGETATION METHODOLOGY AND CRITERIA

To achieve successful reclamation and erosion control on lands disturbed by project development and operation, an effective reclamation program would be required. Important variables within the project area that would strongly affect erosion control and reclamation success include: (1) climatic conditions (low, erratic precipitation and high winds); (2) soil properties, such as shallow depths, thin surface layers, low inherent fertility, moderate to strong salinity and alkalinity, hard bedrock, and the volumes of rock fragments; (3) strongly sloping to very steep sloping terrain; and (4) preconstruction variations in vegetation types and their low densities.

Other variables dependent on land use and management that would influence erosion control and reclamation success include livestock grazing control on restored and seeded areas and off-road vehicle (ORV) traffic control on access roads to minimize off-road land surface disturbance.

Information from the following soil surveys was used to evaluate potential impacts and would be used by the applicants and authorizing agencies to determine applicable erosion control, reclamation, and revegetation measures: (1) Soil Survey of Luna County, New Mexico (SCS 1980); (2) Soil Survey of Grant County, New Mexico, central and southern parts (SCS and FS 1983); (3) Soils of New Mexico (Agriculture Experiment Station 1978); (4) Soil Associations and Land Classification For Irrigation, Sierra County, New Mexico (Agriculture Experiment Station 1972a); (5) Soil Associations and Land Classification For Irrigation, Catron County, New Mexico (Agriculture Experiment Station 1972b); and (6) Soil Associations and Land Classification For Irrigation, Socorro County, New Mexico (Agriculture Experiment Station 1972c).

SOIL GROUPS

Following is a brief description of the general soil groups occurring within the project area.

a. Soils on nearly level to gently sloping broad basin and valley floors (8 to 11 inches average annual precipitation). This group consists of deep, well-drained to moderately well-drained, loam, clay loam and clay soils on nearly level to gently sloping broad basin floors and valley bottoms. These soils formed in mixed alluvium derived mainly from sedimentary and volcanic rocks. The soils are subject to a slight to moderate erosion hazard and in places are moderate to strongly alkaline. These soils are used for livestock grazing and wildlife.

b. Sandy soils on nearly level to gently undulating broad valley floors commonly including coppice dunes (8 to 11 inches precipitation). This group consists of deep, well-drained, sandy and sandy loam soils on nearly level to gently undulating broad valley floors. These soils formed in mixed alluvium and aeolian material derived mainly from sedimentary rock. They are subject to a moderate to high wind erosion hazard. Coppice dunes forming in and around mesquite and other shrubs are common. These soils are used for livestock grazing and wildlife.

c. Soils of the desert mountains and foothills (8 to 11 inches annual precipitation). This group consists mainly of shallow to moderately deep, well-drained, gravelly to rocky sandy loam and loam soils on strongly sloping to steep mountain and foothill sideslopes. These soils formed in mixed colluvial and alluvial materials derived from volcanic, sedimentary, and igneous rocks. They are subject to a moderate and severe erosion hazard. These soils are usually sparsely vegetated.

d. Soils on nearly level to gently sloping, old alluvial fans extending from the mountains (8 to 11 inches annual precipitation). This group consists of moderately deep and deep, well-drained gravelly and cobbly sandy loam and loam soils on nearly level to gently sloping alluvial fans extending from the mountains.

These soils formed in mixed alluvium derived from volcanic, sedimentary, and igneous rocks. They are subject to a slight to moderate erosion hazard. In places, these soils are underlain with highly calcareous substratums. These soils are used for livestock grazing and wildlife.

e. Soils on nearly level to gently sloping floodplains, terraces, and alluvial fans (8 to 11 inches average annual precipitation). This group consists of deep, well-drained to moderately well-drained, loamy soils on nearly level to gently sloping floodplains and terraces. These soils formed in mixed alluvium derived from sedimentary and igneous rocks. They are subject to a slight to moderate erosion hazard and, in some areas, a moderate to strong saline and alkaline condition. They are the most productive soils of the area and are used for grazing. These soils occur in areas with an average annual precipitation of 8 to 11 inches and in areas with 11 to 16 inches average annual precipitation.

f. Soils on gently sloping to strongly sloping alluvial fans and valley fills at the base of mountains (11 to 16 inches annual precipitation). This group consists of deep, well-drained, mildly alkaline to moderately alkaline, loamy soils with varying amounts of coarse fragments (5 to 35 percent by volume) on gently sloping to strongly sloping alluvial fans and valley fills. These soils formed in mixed alluvium derived from sedimentary volcanic and igneous rocks. They are subject to a slight to moderate erosion hazard. These soils are used mainly for livestock grazing and wildlife.

g. Soils on gently sloping to rolling uplands bordering foothills (11 to 16 inches annual precipitation). This group consists of moderately deep and deep, well-drained, mildly alkaline to moderately alkaline, sandy loam, loam, and clay loam soils on gently sloping to rolling uplands. These soils contain coarse fragments ranging from 5 to 35 percent in volume. These soils are subject to a slight to moderate erosion hazard. These soils are used for livestock grazing and wildlife.

h. Soils on gently sloping to strongly sloping alluvial fans and terraces dissected by intermittent drainageways and arroyos, including rough broken land (11 to 16 inches annual precipitation). This group consists of deep, well-drained, mildly alkaline to moderately alkaline, loamy soils containing varying amounts of coarse fragments (5 to 30 percent). They are on gently sloping to strongly sloping alluvial fans and terraces that are dissected by intermittent drainageways and arroyos. Included are areas of rough broken land where several drainageways and arroyos intersect. These soils are subject to moderate erosion hazard and stream cutting. They are used for livestock grazing and wildlife.

i. Soils on the nearly level to gently sloping Plains of San Agustin (11 to 16 inches annual precipitation). This group consists of deep, well-drained, alkaline to moderately alkaline, loam and clay loam soils on nearly level to gently sloping broad valleys. These soils formed in mixed alluvium and lakebed sediments derived from sedimentary volcanic and igneous rocks. They are subject to a slight erosion hazard. These soils are used mainly for livestock grazing.

j. Sandy soils on nearly level to gently sloping and undulating broad valleys (11 to 16 inches annual precipitation). This group consists of deep, well-drained, alkaline to moderately alkaline, sandy loam soils on nearly level to gently sloping broad valleys. These soils formed in mixed alluvial and aeolian materials derived from volcanic and sedimentary rocks. They are subject to a moderate to severe wind erosion hazard. These soils commonly occur in the mesquite-coppice dune areas. They are used for livestock grazing and wildlife.

k. Soils of the mountain foothills (11 to 18 inches annual precipitation). This group consists of mainly moderately deep to deep, well-drained, neutral to mildly alkaline, gravelly sandy loam, loam and clay loam soils on strongly sloping to steep foothills. These soils formed in mixed alluvial and colluvial materials derived from a sedimentary and volcanic rocks. These soils are subject to moderate and severe erosion hazards. These areas are used for livestock grazing and wildlife.

l. Soils of the mountains and mountain valleys (16 to 25 inches annual precipitation). This group consists of mainly shallow and moderately deep, moderately well-drained to well-drained,

gravelly and rocky sandy loam and loam soils on steep and very steep mountain sideslopes and canyon rims. Deep soils are on toe slopes and on the narrow elongated floodplains and meadows included in this group. These soils are subject to landslide in some localized areas and to a moderate to high erosion hazard. They are used mainly for forest (timber), livestock grazing, wildlife, and watershed.

VEGETATION TYPES

The vegetation inventory, forage availability, and revegetation potential information presented in this MFPA/EIS was gathered from the following sources: (1) Draft Grazing Environmental Impact Statement Southern Rio Grande Planning Area (BLM 1981); (2) Las Cruces-Lordsburg Resource Area Draft Management Framework Plan Amendment Environmental Impact Statement (BLM 1983a); (3) West Socorro Rangeland Management Program Draft Environmental Impact Statement (BLM 1982); (4) Applicant's Environmental Analysis 345 kV Transmission Line Tucson, Arizona to San Juan Powerplant, New Mexico (Tucson Gas and Electric Co. 1971); (5) Final Environmental Statement Greenlee County, Arizona to El Paso, Texas 345 kV Transmission Lines (BLM 1976); (6) Soil Survey of Luna County, New Mexico (SCS and FS 1981a); and (7) Soil Survey of Grant County, New Mexico; Central and Southern parts (SCS and FS 1983).

Twelve vegetation types would be affected. These types combine several vegetation communities and range sites. These vegetation types were identifed in order to evaluate potential impacts and determine revegetation and regeneration potential.

Following is a brief description of the major vegetation types occurring within the project area.

a. **Riparian.** This vegetation type occurs mainly in bottomlands and low lying areas bordering major perennial streams. This type also occurs along the larger tributaries that are poorly drained or receive runoff from adjoining slopes. Riparian communities are generally comprised of salt cedar, scattered cottonwood trees, willows, sedges, rushes, some wheatgrasses, and alkali sacaton.

   The riparian zone is one of the highest producers of forage per acre and is important to wildlife. Riparian vegetation stabilizes stream banks, helps protect the quality of stream water, and provides diversity to the area.

b. **Pseudoriparian.** This type occurs mainly in bottomlands and low-lying areas along intermittent drainageways that receive periodic overflow. The vegetation consists mainly of desert willow, sumac, algerita, and Apache plume. Grasses include tobosa, dropseeds, blue grama, sideoat grama, burrow-grass, and bluestems. These areas are used mainly for grazing and are important wildlife habitat. The regeneration potential is fair to good due to the periodic overflow.

c. **Yucca-Grassland.** This type most commonly occurs on level mesas and in broad basins. Is composed primarily of dropseed and grama grasses with varying densities of soaptree yucca. Species commonly associated with this type include: black grama, blue grama, tobosa grass, sand dropseed, mesa dropseed, Mormon tea, winterfat, broom snakeweed, creosote bush, soaptree yucca, and mesquite. Broad tobosa grass swales are extremely common in this type, becoming most prevalent in the lower elevations where drainages fan out onto the floodplains. In general, this type enhances the scenic value of the landscape wherever it occurs. This type is used mainly for livestock grazing.

d. **Mesquite-Grassland.** This type occurs mainly on the nearly level to gently sloping broad basin floors and valleys, generally on more sandy soils. Vegetation consists mainly of mesquite, broom snakeweed, yucca, and some four-wing saltbush. Grasses include dropseed, tobosa, plains bristlegrass, burrow-grass, sand dropseed, and bush muhly. These areas are used mainly for livestock grazing and wildlife. Vehicles have difficulty penetrating areas where dense stands of mesquite occur.

e. **Creosote Bush.** This vegetation type occurs on nearly level to gently sloping alluvial fans dissected by intermittent drainages in the eastern portion of the project.

Shrub species include creosote, mimosa, yucca, broom snakeweed, and catclaw. Grass species include blue grama, sideout grama, dropseed, tobosa, plains bristlegrass, and bush muhly. In some areas, vast stands of creosote are so competitive almost no grass and few other woody species occur. This type is used for livestock grazing and wildlife.

f. **Mesquite-Dunal.** This type occurs mainly in the area north and east of Deming, on nearly level to gently sloping and undulating basin floors including coppice dunes. The vegetation consists mainly of mesquite, broom snakeweed, and yucca. Grass cover is sparse including sand dropseed, bush muhly, and plains bristlegrass. The areas are used mainly for wildlife and limited livestock grazing. The coppice dunes make cross-country travel difficult. Clearing operations will require blading through areas with this vegetation type.

g. **Grassland.** This vegetation type occurs on nearly level to sloping basin floors, mesas, terraces, and alluvial fans. The dominant species are blue grama, black grama, sideoat grama, dropseeds, needlegrass, western wheatgrass, and some little bluestem. Other species include broom snakeweed, yucca, and cholla. This type is used mainly for livestock grazing. This vegetation type includes both plains grasslands (MRLA 36) and desert grasslands (MRLA 42) and associated shrubs.

h. **Sagebrush-Grass.** This type most commonly occurs on benches and on the gently sloping to undulating sandy areas in the Plains of San Agustin. This type is characterized by an overstory of sagebrush including big sage and low sage or black sage. The main understory grasses are needlegrass, western wheatgrass, and salina wildrye. These areas are used for livestock grazing and wildlife.

i. **Pinyon-Juniper.** This type occurs on the sloping to strongly sloping fans and foothills areas where precipitation is more than 11 inches. Juniper trees are the major species with pinyon pine increasing with elevation and precipitation. Common species include Utah juniper, pinyon pine, mountain mahogany, Morman tea, and winterfat. Grasses include galleta grass, western wheatgrass, blue grama, black grama, sideoat grama, and western wheatgrass.

These areas are used for livestock grazing and wildlife. Some wood products are used for firewood. Vegetation manipulation (chaining) has been conducted on this vegetation type to increase grass production with successful results.

j. **Mountain Shrub.** This type occurs on the moderate to steep sideslopes at higher elevations with more than 12 inches annual precipitation and shorter frost-free seasons. The most dominant species include mountain mahogany, Gambel oak, needle-and-thread grass, western wheatgrass, Indian rice grass, and forbs such as lupines and aster. These areas provide forage for livestock and are critical to wildlife.

k. **Mixed Conifer.** This type consists of several plant communities that are characteristic of the north-facing, steep-sloping mountain sideslopes and ridges, as well as elevations above 7,800

feet and more moist precipitation zones. Most common species are Ponderosa pine, Douglas fir, some white fir and Engleman spruce, with an understory of mountain mahogany and fescue.

This vegetation type is used for limited livestock grazing, some firewood, poles for timber, and for wildlife.

ASSUMPTIONS

Erosion control and expected reclamation success on lands disturbed by project construction and operation activities are based on the following assumptions:

a. The applicant would comply with the proposed erosion control and reclamation program it developed and follow through on its commitment to "comply with appropriate regulations and required plans and stipulations to protect and restore the land disturbed by project construction and operation to a stable, productive, and aesthetically acceptable condition."

b. The applicant operating on New Mexico state land would prepare and follow appropriate plans, including applicable measures and procedures to accomplish and ensure successful reclamation of state land affected by project construction and operation, as required by the State of New Mexico Commissioner of Public Lands.

c. The applicant would comply with soil protection and land use goals identified by the landowner on private lands.

d. The "Erosion Control, Revegetation, and Restoration Guidelines for use on Federal Lands" (Appendix 2) would be included as stipulations in the right-of-way grants issued to the applicants by the Bureau of Land Management (BLM) and Forest Service, and would also be implemented for all other lands, including state lands and private lands, as agreed to by the applicants and landowner.

EROSION CONTROL, RECLAMATION, AND REVEGETATION — PROGRAM ANALYSIS METHODOLOGY AND CRITERIA

The erosion control, reclamation, and revegetation guidelines were developed and evaluated using information collected in the soils and vegetation review of the project. The evaluation determined that if the procedures were followed and the appropriate monitoring occurred, the disturbed areas would be successfully revegetated upon completion of construction. The methodology used to complete the evaluation is discussed below.

Soils, vegetation, and climatic information was collected for the surface areas that could be disturbed by the Proposed Action or alternatives. Soil surveys were reviewed to identify soil types and terrain strongly affecting construction activities, erosion control, and reclamation potential.

The soils data was analyzed and evaluated to identify:

- areas with soil properties that strongly affect restoration of cropland and revegetation of native rangeland;
- areas subject to slides, rockfall, and mass movement;
- areas that are susceptible to high wind and water erosion hazards;
- effective measures to minimize the effect of soil disturbances caused by construction activities and to control accelerated erosion; and
- areas where erosion and resultant sediment yield would affect water quality.

Soil erosion losses were estimated using the universal soil loss equation (USLE) and the wind erosion equation as applied to construction sites for selected soil areas representing various conditions occurring throughout the proposed project area. Recent developments in the USLE make it a potentially valuable tool for selecting and evaluating conservation practices on areas disturbed by construction activities. The information gained by application of the USLE to selected soil sites was used as a basis for determining appropriate erosion control and revegetation measures and to evaluate the effectiveness of those measures to ensure successful erosion control, revegetation, and restoration.

Selected soils representing significant conditions in the project areas were analyzed. Additional information, consisting of major rangeland management concerns and recommended conservation practices, was obtained from published detailed soil survey reports and the Soils of New Mexico publication.

Vegetation data was analyzed and evaluated to identify:

- areas of critical vegetation types;
- regeneration potential; and
- effective revegetation measures.

The reclamation and erosion control guidelines were developed from the procedures outlined above to cover the range of soil and vegetation types, terrain, land uses, and climatic conditions. A detailed construction and erosion control plan will be developed prior to construction including locally recommended techniques and measures tailored to the conditions encountered. Proper

implementation of the outlined erosion control and revegetation measures would assure successful restoration of land disturbed by project construction activities.

The maintenance and monitoring program (Appendix 2) would also identify problem areas caused by adverse weather conditions during restoration periods or in small localized areas with adverse soils properties, and would provide corrective measures to ensure erosion control.

SUMMARY

It is predicted that successful erosion control, reclamation, and revegetation generally would be achieved throughout the project area provided that the applicant implemented effective measures and procedures tailored to the kind of land disturbance and to the conditions encountered. It is emphasized, however, that in order to ensure erosion control and reclamation success, a strong compliance program accompanied by an effective monitoring and maintenance program is needed to ensure that applicable measures are effectively applied and that follow-up measures are carried out. The compliance program would be conducted by the appropriate authorizing agencies and landowners. However, impacts to soils and the potential to reproduce vegetation to pre-construction densities would be significant if applicable erosion control measures were not implemented due to lack of compliance with approved plans or if adverse weather conditions, mainly heavy rainstorms, occurred during construction before any erosion control measures could be installed.

APPENDIX 8

SOCIOECONOMICS

This appendix describes the data sources and methods used to analyze the impacts. It is divided into the following sections:

Employment
Personal income and per capita personal income
Population
Local government revenue

In each section, the sources of baseline and impacts data and the analytical methods are described for that subject. Short-form references are given; complete references can be found in References Cited.

Primary employment and payroll figures were provided by the applicant. Population estimates were derived from primary employment by means of ratios, as described under Population. Secondary employment and income estimates were obtained by using the Forest Service's IMPLAN model. IMPLAN is an input-output type of economic model that is based on the national input-output coefficients (see reference under Employment). Analyses of labor force and unemployment levels in the area of influence indicated that all secondary employment needs could be met locally, so no additional population from secondary sources was assumed.

EMPLOYMENT

Baseline

Sources:

1982 data: U.S. Department of Commerce, Bureau of Economic Analysis 1983a.

1990 projections: Temple and Wombold 1983.

Method: Projections made for 1990. Estimates for 1986 derived by interpolation between 1982 and 1990.

1990 projections

Agriculture: Least squares trend calculated on 1970–1980 data (Temple and Wombold 1983). Trend extrapolated to 1990.

Nonagricultural covered employment: Temple and Wombold 1983

Noncovered employment: 1980, estimated as difference between Bureau of Economic Analysis total employment and sum of Temple and Wombold agricultural and nonagricultural covered employment. Projected at combined growth rate of agricultural and nonagricultural covered employment (described above).

Impacts

Peak construction employment (Jensen 1984c):

Transmission line:

Average spread: 65 workers

San Agustin Alternative, north spread: 80 workers

Gila Alternative, north spread: 100 workers

Luna substation: 6 workers

Secondary employment: Obtained from IMPLAN model (Forest Service 1983).

Gravity model allocation:

Basic gravity model: Population of each community is divided by travel time from site. The resulting quotients are summed. Percent of that total for each community is calculated.

Modifications for this analysis:

Each spread was divided into three parts, giving reference points at 1/3 and 2/3 the distance of that spread. The model was run at each reference point and the results averaged for

each spread. Separate model runs for the spreads and the Luna substation were summed to obtain the final results.

Allocations of less than 5 percent were reallocated to the nearest community having an allocation of 5 percent or more. On a continually moving project, it is assumed that workers would favor larger communities within reasonable commuting distance.

A separate gravity model analysis was made for secondary employment, including only those communities for which primary employment was allocated, and using retail sales in place of population.

PERSONAL INCOME AND PER CAPITA PERSONAL INCOME

Baseline personal income

Sources:

1981 and 1982 data: U.S. Department of Commerce, Bureau of Economic Analysis 1983b.

1990 projections: Temple and Wombold 1983.

Method: Projections made for 1990. Estimates for 1986 derived by interpolation between 1982 and 1990.

1990 projections calculation: A/B x C, where:

A = 1990 real county income per capita times 1990 population (Temple and Wombold 1983)

B = 1981 real county income per capita times 1981 population (Temple and Wombold)

C = 1981 total personal income (Bureau of Economic Analysis 1983b).

Personal income impacts

From primary employment (Jensen 1984a): workmonths times payroll per workmonth.

From secondary employment: Obtained from IMPLAN model.

Allocations made to counties in the same proportions as employment allocations.

Per capita personal income

Total personal income divided by population.

POPULATION

Baseline

Sources:

1980 data: New Mexico Employment Security Department, Research and Statistics Section 1983.

1982 data: U.S. Department of Commerce, Bureau of Economic Analysis 1983b.

1990 projections: Temple and Wombold 1983.

Method: County estimates for 1986 derived by interpolation between 1982 and 1990. Community estimates for 1986 calculated so that growth rate for communities is twice the growth rate for unincorporated areas.

Impacts

From primary employment:

Assumed 10 percent locally hired (El Paso Electric Company 1984).

Assumed family size breakdown (Western Research Corporation 1984):

56 percent single or married without family present.

44 percent married with family present.

Assumed average family size: 3.42 (U.S. Department of Commerce, Bureau of the Census 1982).

From secondary employment: Assumed to come from the local labor force.

LOCAL GOVERNMENT REVENUE

Baseline

Sources of 1982 data:

New Mexico Department of Finance and Administration 1983a.

New Mexico Department of Finance and Administration, Public School Finance Division, 1983.

Method: 1982 data increased to 1986 and 1990 estimates in ratio to population.

Impacts

CONSTRUCTION

Sources:

Construction equipment cost: Jensen 1984b.

Depreciation: Assumed 50 percent depreciation

Assessment rate: Martinez 1983

Mill levies: New Mexico Department of Finance and Administration 1983b.

Method: Construction equipment location on January 1 (New Mexico tax assessment date) estimated from construction schedule and transmission line mileposts. When location would be close to county or school district boundary, cost was divided equally between the jurisdictions.

Revenue equals construction equipment cost times depreciation percent times assessment rate times mill levy.

OPERATION

Sources:

Investment cost: Jensen 1984c
Other data: Same as construction

Method: Transmission line cost divided among jurisdictions in proportion to mileage. Revenue calculation same as for construction.

REFERENCES CITED

In order to help the reader locate copies of these references, symbols are used to indicate the following:

a - Can be inspected at the Bureau of Land Management, Division of Environmental Impact Statement Services, 555 Zang Street, First Floor East, Denver, Colorado 80228. Copies of some items are available at cost for reproduction.

b - Can be inspected at the Bureau of Land Management District Office, Las Cruces, New Mexico.

c - Available from El Paso Electric Company, PO Box 982, El Paso, Texas 79960.

d - Can be inspected at the Forest Service, Forest Supervisor's Office, Gila National Forest, Silver City, New Mexico 88601

e - Available at any public library

f - Can be inspected at the Bonneville Power Administration, Division of Laboratories, PO Box 491, Vancouver, Washington 98666.

Agricultural Experiment Station.
1978. *Soils of New Mexico.* Research Report 285. New Mexico State University. Las Cruces. a

1972a. *Soil Associations and Land Classification for Irrigation, Sierra County.* (In cooperation with Water Resources Institute and Soil Conservation Service). Research Report 233. New Mexico State University. Las Cruces. a

1972b. Soil Associations and Land Classification for Irrigation, Catron County. (In cooperation with Water Resources Institute and Soil Conservation Service). Research Report 229. New Mexico State University. Las Cruces. a

Agricultural Experiment Station.
1972c. *Soil Associations and Land Classification for Irrigation, Socorro County.* (In cooperation with Water Resources Institute and Soil Conservation Service). Agricultural Experiment Station. Research Report 234. New Mexico State University. Las Cruces. a

ANSI C63.2-1980.
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ABBREVIATIONS AND ACRONYMS

AC—alternating current

ANSI—American National Standard Specifications

AUM—animal unit month

BLM—U.S. Department of the Interior, Bureau of Land Management

BPA—Department of Energy, Bonneville Power Administration

BW—bandwidth

CDNST—Continental Divide National Scenic Trail

cm—centimeter

COM Plan—Construction, Operation and Maintenance plan

CEQ—Council on Environmental Quality

CFR—Code of Federal Regulations

dB—decibels

dBW/m²/Hz—decibels above 1 watt per square meter per hertz

EA—Environmental Assessment

EIS—Environmental Impact Statement

EMI—electromagnetic interference

EPA—Environmental Protection Agency

FS—U.S. Department of Agriculture, Forest Service

FWS—U.S. Department of the Interior, Fish and Wildlife Service

GHz—gigahertz

KHz—kilohertz

kV—kilovolt

MFP—Management Framework Plan

MFPA/EIS—Management Framework Plan Amendment/Environmental Impact Statement

MHz—megahertz

MLRA—major land resource area

MP—milepost

mph—miles per hour

N/A—not applicable

ORV—off-road vehicle

ppm—parts per million

QP—quasi-peak

rms—root mean square

secs.—sections

Stat—statute

TEPC—Tucson Electric Power Company

TSP—total suspended particulates

TVI—television interference

U.S.C.—United States Code

USLE—Universal Soil Loss Equation

VLA—Very Large Array

VLBA—Very Long Baseline Array

VMS—Visual Management System

Vol.—volume

VQO—Visual Quality Objectives

VRM—Visual Resource Management

WSA—Wilderness Study Area

GLOSSARY

ACCELERATED EROSION—Soil loss more rapid than normal, natural, or geologic erosion, mainly as a result of the influence of human activities or in some cases of animals or natural catastrophies that expose bare surfaces.

AIR QUALITY CLASS I, II, AND III AREAS—Regions in attainment areas where maintenance of existing good air quality is of high priority. In Class I areas, maintaining air quality has the highest priority with respect to other values; in Class III areas, air quality has lower priority than it does in the other areas. Initially, all attainment areas except mandatory Class I areas were designated Class II.

AIR QUALITY STANDARDS—The concentrations of pollution and lengths of exposure at which specified adverse effects to health and welfare occur.

ALLOTMENT—An area where one or more operators graze their livetsock. An allotment generally consists of public lands but may include parcels of private and state-owned lands. BLM stipulates the number of livestock and season of use for each allotment, which may consist of one or several pastures.

ALLUVIAL FAN—A sloping, fan-shaped mass of sediment deposited by a stream or drainageway where it emerges onto a plain.

ALLUVIUM—Clay, silt, sand, gravel, or other loose stream-deposited material.

ALTERNATING CURRENT (AC)—An electric current that reverses its direction of flow periodically as contrasted to direct current.

AMBIENT AIR QUALITY—Concentration levels in the surrounding air for a specified pollutant and a specified averaging time period within a geographic region.

AMBIENT AIR QUALITY STANDARD—Established by federal or state agencies, the level of ambient air quality to be achieved and maintained. Primary standards are those judged to be needed, with an adequate margin of safety, to protect the public health. Secondary standards are those judged to be needed to protect the public welfare from any known or expected adverse effects of a pollutant. Ambient standards are given in micrograms per cubic meter ($\mu g/m^3$).

ANIMAL UNIT MONTH (AUM)—The amount of forage a cow and a calf (6 months of age and under) consume in 1 month. This unit is used to calculate livestock carrying capacities and serves as a basis for grazing fees.

ARCHAIC PERIOD—A culture period of hunting and gathering subsistence patterns; the development of barbed and stemmed projectile points for use as spears, grinding and milling stones for food preparation, and ground and polished stone tools for everyday use; and the adoption of a seasonally migratory life-style. Sites of this period usually date from 7500–1500 before the present.

ATTAINMENT AREA—An area where the National Ambient Air Quality Standards are not violated. Additional pollution in these areas is limited. See Prevention of Significant Deterioration.

AUTHORIZED OFFICER—A designated federal regulatory agency employee responsible for activities involving the use of public lands or delegated to exercise authority over grants for use of these lands.

BACKFILL—The material used to refill a ditch or other excavation or the process of doing so.

BASELINE—Projected conditions expected to exist in the area of influence, excluding applicant and interrelated projects.

BIOLOGICAL OPINION—An official report by the Director of the Fish and Wildlife Service issued in response to a formal request by BLM for consultation under the provisions of these regulations and representing the government's position as to the expected effects of a proposal on the conservation of a listed species or its habitat.

BUNDLE—Two conductors secured together but spaced so they do not touch.

CANDIDATE SPECIES—Species not yet officially listed as threatened or endangered but which are undergoing a status review or are proposed for listing according to the ***Federal Register*** notices published by the Secretary of the Interior or according to comparable state documents published by state officials.

CLIMATE—The average cause or condition of the weather at a place over a period of years.

CONDUCTOR—A wire or cable, usually made up of multiple strands of metal, that is suitable for carrying electrical current. One conductor carries one phase.

CORONA—A discharge, which is often luminous, at the surface of a conductor. It is accompanied by ionization of the surrounding atmosphere and power loss.

CORRIDOR—For purposes of this MFPA/EIS, a stretch of land generally a few miles wide within which one or more linear facilities may be planned.

COW-CALF LIVESTOCK OPERATION—A livestock operation in which a base breeding herd of mother cows and bulls is maintained. The cows produce a calf crop each year, and the operation keeps some heifer calves from each calf crop for breeding herd replacements. The operation sells the rest of the calf crop between the ages of 6 and 12 months along with old or non-productive cows and bulls.

COW-CALF-YEARLING LIVESTOCK OPERATION—A cow-calf operation that, instead of selling its calves between the ages of 6 to 12 months, sells them after they are 12 months old.

CRITICAL AREA—An area of habitat that is essential to the survival of any wildlife species sometime during its life cycle.

CULTURAL RESOURCE INVENTORY CLASSES:

Class I - Existing data inventory: an inventory study of a defined area designed (1) to provide a narrative overview (cultural resource overview) derived from existing cultural resource information and (2) to provide a compilation of existing cultural resource site record data on which to base the development of the BLM's site record system.

Class II - a sample-oriented field inventory designed to locate and record, from surface and exposed profile indications, all cultural resource sites within a portion of a defined area to allow an objective estimate of the nature and distribution of cultural resources in the entire defined area.

The Class II inventory is a tool for use in management and planning as an accurate predictor of cultural resources in the area of consideration. The primary area of consideration for implementing a Class II inventory is a planning unit. The secondary area is a specific project in which an intensive field inventory (Class III) is neither practical nor necessary.

Class III - an intensive field inventory designed to locate and record, from surface and exposed profile indications, all cultural resource sites within a specified area.

After Class III inventories are completed in an area, no further cultural resource inventory work is normally needed. A Class III inventory is appropriate on small project areas, all areas to be disturbed, and primary cultural resource areas.

CULTURAL RESOURCES—Remains of human activity, occupation, or endeavor, reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features that were of importance in past human events. These resources consist of (1) physical remains, (2) areas where significant human events occurred, even though evidence of the event no longer remains, and (3) the environment immediately surrounding the actual resource.

DEAD-END TOWER—A transmission tower generally employed for a deviation of a power line at a large angle from a straight line.

DENDRITIC DRAINAGE (Pattern)—A drainage pattern with tributaries branching like a tree's boughs.

DISPERSION POTENTIAL—The ability of the atmosphere to dilute or disperse air pollutants as determined by normal ventilation values. A high dispersion potential results from high ventilation values, which can be caused by high transport wind speeds, high mixing heights, or high values of both.

DOWNSTREAM TRAFFIC—The direction along a roadway toward which the vehicle flow under consideration is flowing.

ELECTROMAGNETIC INTERFERENCE—Any electrical or magnetic disturbance which will change or modulate a received signal, usually applied to disruption of radio or TV signals.

ENDANGERED SPECIES—Any animal or plant species in danger of extinction throughout all or a significant portion of its range.

FORBS—Low-growing, herbaceous plants that are not a grass, sedge, or rush.

FUGITIVE DUST—Airborne particles emitted from any source other than through a stack.

GUYED TOWER—Tower supported by a tension member (a solid wire or stranded wire) to withstand an otherwise unbalanced force on the tower.

HABITAT—A specific set of physical conditions that surround the single species, a group of species. or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover, and living space.

INSULATOR STRING—A string of porcelain units in series which support the conductors on transmission towers and insulates them from electrical ground. These units may be in a vertical, horizontal, or a vee string configuration or arrangement.

KILOVOLT (kV)—A unit of potential difference equal to 1,000 volts. Electric power is under pressure which is measured in volts, whereas amperes indicate the numbers of electrons flowing past a point at any given moment; volts indicate the speed at which they travel. Volts times amperes equals watts.

LEVEL-OF-SERVICE (Transportation)—In transportation studies, a qualitative measure of traffic flow along a given road in consideration of a variety of factors, including speed and travel time, traffic interruptions, and freedom to maneuver. Levels-of-service are designated A through F, A being a free-flow condition with low volumes and high speeds and F being a congested condition of low speeds and stop-and-go traffic. Intermediate levels describe conditions between these extremes. A level-of-service below C involves unstable to forced traffic flow in which a driver's freedom to select a speed is restricted and in which traffic stoppages cause congestion.

MANAGEMENT FRAMEWORK PLAN (MFP)—A public land use plan that states the goals and constraints for a specific area and provides guidance for managing the area's resources.

MITIGATION—The abatement or reduction of a construction or operation impact to the environment by (1) avoiding a certain action or parts of an action, (2) employing certain construction measures to limit the degree of impact, (3) restoring an area to preconstruction conditions, (4) preserving or maintaining an area throughout the life of a project, or (5) replacing or providing substitute resources to the environment.

NATIONAL AMBIENT AIR QUALITY STANDARD (NAAQS)—The allowable concentrations of air pollutants in the air specified by the Federal Government in Title 40, Code of Federal Regulations, Part 50. The air quality standards are divided into primary standards (based on the air quality criteria and allowing an adequate margin of safety, are requisite to protect the public health) and secondary standards (based on the air quality criteria and allowing an adequate margin of safety and requisite to protect the public welfare from any unknown or expected adverse effects of air pollutants). Welfare includes effects on soils, water, crops, vegetation, manufactured materials, animals, wildlife, weather, visibility and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well being.

NATIONAL REGISTER OF HISTORIC PLACES—The official list, established by the Historic Preservation Act of 1966, of the nation's cultural resources worthy of preservation.

NATIONWIDE RIVERS INVENTORY—The Nationwide Rivers Inventory program is a listing being kept by the National Park Service of the best remaining free-flowing rivers in the nation that may be appropriate for protection at the federal, state, or local level.

NOXIOUS PLANT—A plant that is undesirable because it conflicts with or restricts management objectives, or otherwise causes problems.

OFF-ROAD VEHICLE (ORV)—A vehicle (including 4-wheel drive, trail bikes, and snowmobiles but excluding helicopters, fixed-wing aircraft, and boats) capable of traveling offroad over land, water, ice, snow, sand, marshes, and other terrain.

OVERSTORY (Vegetation)—The upper canopy or canopies of plants, usually consisting of trees, tall shrubs, and vines.

PALEO-INDIAN—Earliest documented hunting and gathering groups in North America, dating from 12,000 to 6,000 BC.

PENTACHLOROPHENOL—A toxic substance used to treat wood to protect it from bacterial or fungal breakdown. Often referred to as *Penta*.

PHASE CONDUCTOR BUNDLES—The line made up of two conductors in a bundle carrying one phase.

PHYSIOGRAPHIC PROVINCE—An extensive portion of the landscape normally encompassing hundreds of square miles, portrayed by similar qualities of soil, rock, slope, vegetation, and climate of the same geomorphic origin.

PARTICULATE MATTER—Any material, except water in a chemically uncombined form, that is or has been airborne and exists as a liquid or solid at standard temperature and pressure conditions. (Examples include dust, soot.)

PREVENTION OF SIGNIFICANT DETERIORATION (PSD)—Requirements of the Clean Air Act designed to keep the air clean in areas where it is better than the National Ambient Air Quality Standards. PSD regulations apply in attainment areas.

PRIMITIVE RECREATION—Those types of recreation activities associated with unroaded land, such as hiking, backpacking, and cross country travel.

PSEUDORIPARIAN (Vegetation)—Vegetation species that are not usually considered as riparian (desert willow, sumac, algerita, apache plume, tobosa grass, blue grama grass) but which occur only along intermittent drainageways where they receive occasional moisture. If it were not for the occasional moisture in these drainageways, these plants would not exist.

RECLAMATION—The process of converting disturbed land to its former use or other productive uses.

RIPARIAN LAND—Land along the edge of a stream or other body of water.

SCOPING—An early and open process for determining the scope of issues to be addressed in an environmental impact statement and for identifying the significant issues related to a proposed action.

SENSITIVE PLANT SPECIES—Plants whose populations are consistently small and widely dispersed or whose ranges are restricted to a few localities, such that any appreciable reduction in numbers, habitat availability, or habitat condition might lead toward extinction. Sensitive plants also include species rare in one locality but abundant elsewhere. See definitions for Endangered Species and Threatened Species.

SHIELD WIRES—Conductors erected along the top of towers and poles to protect insulators and conductors from lightning damage.

SOIL PRODUCTIVITY—The capacity of a soil to produce a plant or sequence of plants under a system of management.

SPREADS—Construction workers and equipment required to build specific segments of a transmission line.

THREATENED SPECIES—Any plant or animal species likely to become endangered within the foreseeable future throughout all or a part of its range.

THREE PHASE—Electrical current delivered through three wires, with each wire serving as the return for the other two, and with the three current components differing in phase successively by one-third cycle, or 120 electrical degrees.

TRANSMISSION LINE—A line of structures and conductors used for transporting electrical power at 69 kilovolts or more.

TRANSMISSION SYSTEMS—Arrangements of transmission lines, substations, and generating stations used for delivering electrical power.

UNDERSTORY (Vegetation)—Plants growing beneath the canopy of other plants, usually grasses, forbs, and low shrubs.

VEGETATION TYPE—A plant community with distinguishable characteristics described by the dominant vegetation present.

VISUAL QUALITY OBJECTIVES (VQO)—Measurable standards or objectives for the management of visual resources on National Forest lands.

VISUAL RESOURCE MANAGEMENT (VRM)—The planning, design, and implementation of management objectives to provide acceptable levels of visual impacts for all resource management activities.

VISUAL RESOURCE MANAGEMENT CLASS (VRM Class)—The degree of visual change acceptable within the existing characteristic landscape. An area's classification is based upon the physical and sociological characteristics of any given homogeneous area and serves as a management objective.

WILD AND SCENIC RIVERS ACT (Public Law 90-542)—An act providing for the designation and protection of rivers of national significance if they are free-flowing and contain one or more outstandingly remarkable scenic, recreation, geologic, fish and wildlife, historic, cultural, or other similar values.

WILDERNESS AREAS—Uncultivated, uninhabited, and usually roadless areas set aside by Congress for preservation of natural conditions.

WILDERNESS STUDY AREA (WSA)—A roadless area or island that has been inventoried and found to have wilderness characteristics as described in Section 603 of the Federal Land Policy and Management Act

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PUBLIC HEARINGS REGISTRATION FORM

First public hearings on the draft El Paso Electric 345 kV, Springerville to Deming, Transmission Line Project Management Framework Plan/Environmental Impact Statement.

(Please Print)

To: Jack D. Edwards, Division of EIS Services, First Floor East, 555 Zang Street, Denver, Colorado 80228

From: Name _____

Street Address _____

City, State _____ _____ Zip Code _____

Representing _____

I wish to appear at the _____ public hearing on _____
(town)
1984 to express my views on the adequacy of the MFPA/EIS.

I intend to submit written documentation: Yes _____ No _____

_____
Signature

Verbal testimony will be limited to 10 minutes; written testimony will be accepted at the above address until close of business on April 30, 1985. Registration forms are to be submitted by March 27, 1985. Registration will also be accepted at the door for each hearing.

staple or tape together here

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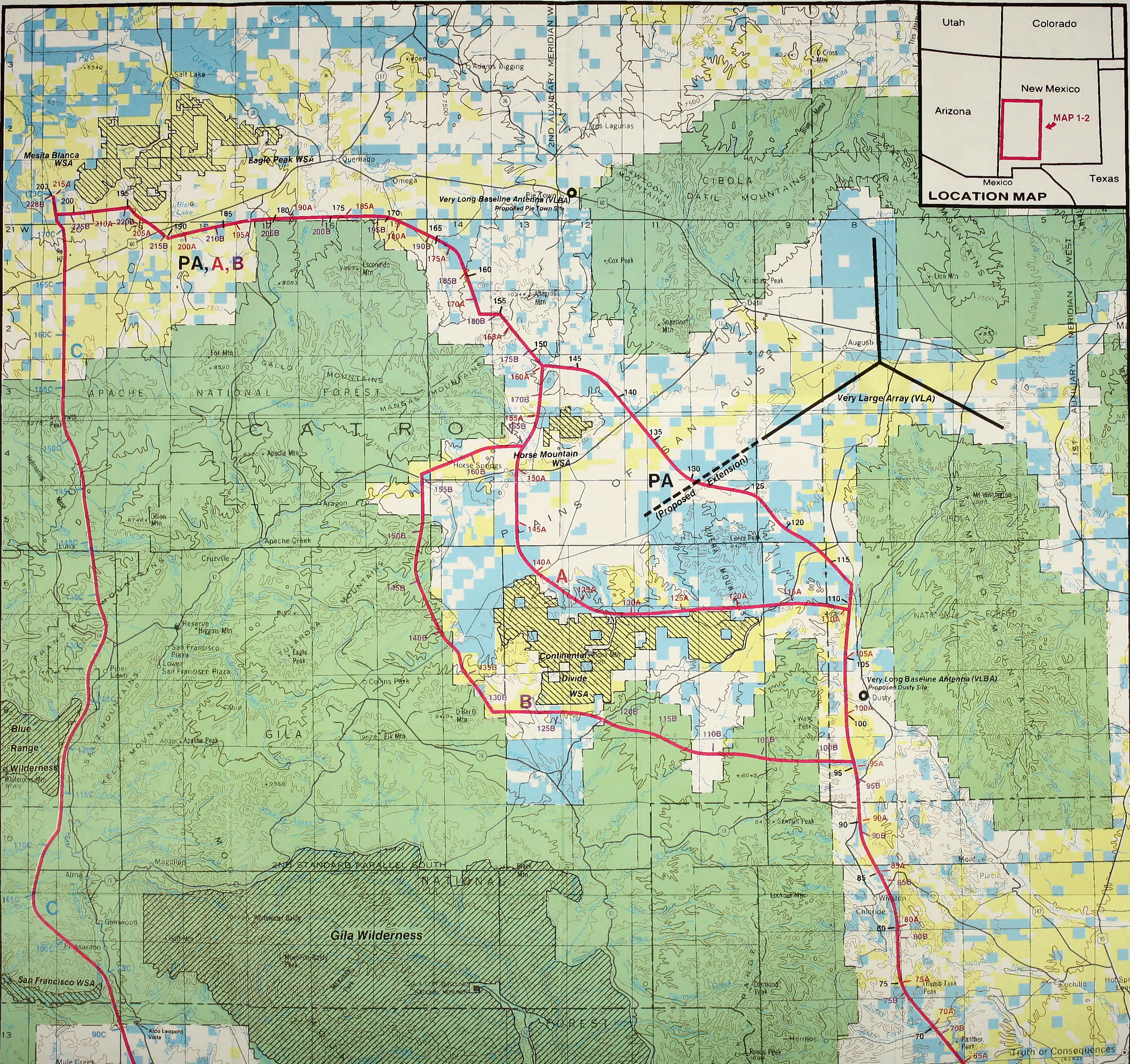
Attn: **Jack Edwards**



Utah
Colorado
New Mexico
Arizona
MAP 1-2
Mexico
Texas
LOCATION MAP
Mesita Blanca WSA
Eagle Peak WSA
Salt Lake
Quemado
Omega
Adams Digging
Tres Lagunas
2ND AUXILIARY MERIDIAN WEST
Very Long Baseline Antenna (VLBA)
Proposed Pie Town Site
Pie Town
CIBOLA
DATIL MOUNTAINS
Very Large Array (VLA)
Datil
Augustine
PA, A, B
PA
(Proposed Extension)
A
B
C
APACHE NATIONAL FOREST
GALLO MOUNTAINS
MANGAS MOUNTAINS
CATRON
PLAINS OF SAN AGUSTIN
Horse Mountain WSA
Horse Springs
Aragon
Apache Creek
Cruzville
Reserve
San Francisco Plaza
Lower San Francisco Plaza
Pine Lawn
Collins Park
Continental Divide WSA
Very Long Baseline Antenna (VLBA)
Proposed Dusty Site
Dusty
Blue Range Wilderness
GILA
NATIONAL FOREST
2ND STANDARD PARALLEL SOUTH
Gila Wilderness
Mogollon
Alma
Glenwood
Pleasanton
San Francisco WSA
Aldo Leopold Vista
Mule Creek
Winston
Chloride
Monticello
Truth or Consequences
1ST AUXILIARY MERIDIAN WEST

LEGEND

Transmission Line Route

Proposed Action	PA
Very Large Array Alternative	A
San Agustin Alternative	B
Gila Alternative	C
Milepost	125
*Wilderness	
*Wilderness Study Area (WSA)	

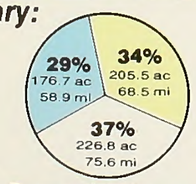
* Only those wilderness areas and WSAs near the Proposed Action or alternative routes are shown

Land Ownership:

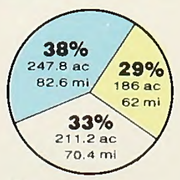
- BLM
- State of New Mexico
- Private
- National Forest

0 5 10 15 20 miles

Summary:

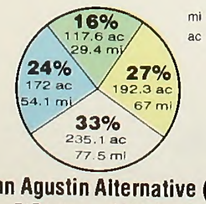


Proposed Action
609 acres – 203 miles

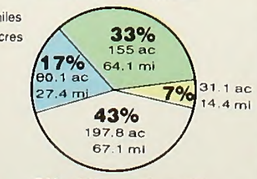


Very Large Array Alternative (A)
645 acres – 215 miles

mi – miles
ac – acres



San Agustin Alternative (B)
717 acres – 228 miles



Gila Alternative (C)
464 acres – 173 miles

MAP 1-2 EL PASO TRANSMISSION LINE PROJECT

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